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Contents.

Diary Dates.

Wednesday,10 March 1993 Commencing 7.00 pm.
The Foundation Lecture.
"The Voyages of Columbus: Legend, reality and medical significance". Surgeon Vice-Admiral Sir James Watt.KBE.

Admission by ticket only (gratis), obtainable from the Royal Pharmaceutical Society of Great Britain.

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Friday - Sunday, 2-4 April 1993
The Spring Conference at Plymouth Moat House Hotel, Plymouth.

Friday, 2 April.
Afternoon Registration.
6.30 pm. Sherry reception. Lord Mayor to open Conference.
7.00 pm. Dinner.

Saturday, 3 April.
9.30 am. "Cookworthy - Chemist & Potter" by Mr A.G.M.Madge
10.15 am "The Unwinged Aquila -A study of Sir Walter Ralegh's chemical manuscript." by Dr M.P.Earles.
11.00 am. Coffee.
11.30 am. "The History of A.H.Cox & Co.Ltd." by Mr C.Fearon of Cox & Hoechst.
12.30 pm. Lunch. Afternoon. Free.
7.00 pm. Dinner
After Dinner. "Humour and Invective in Pharmacy" by Dr Peter Redfern.

Sunday, 4 April.
9.30 am Annual General Meeting.
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11.30 am. "The Rise and fall of an English Spa"by Miss Mary Knowles.

Tuesday, 11 May 1993.
Paper by Mr R. Blyth, former editor of The Pharmaceutical Journal.

Society Members' Activities.

Geoffrey Miller,FPS,of Western Australia was so interested in K.D. Richardson's article on Laudanum in *The Pharmaceutical Historian* (March 1992) that he sought permission to make use of it in one of his articles in *Australian Pharmacist.* It has now appeared and by a happy coincidence he illustrated it with one of D.Richardson of Fremantle's labels for Cough Essence containing Aniseed, Peppermint, Laudanum and Paregoric.

Old English patent medicines in America by George Griffenhagen and James Harvey Young has been described as a classic in the literature of the history of pharmacy. Copies were soon exhausted when published in 1959 and now the American Institute of the History of Pharmacy has decided to reprint it together with some updated material. It is obtainable from AIHP, Pharmacy Bldg., 425, N.Charter St., Madison, Wisconsin, 53706, USA. Price $3.50 postpaid.

A paper by Dr J. Burnby has been published in *The Derbyshire Archaeological Journal* (1992,CXII) entitled "The early years of an archbishop". Archbishop Secker (1693-1768) before he entered the Church had decided to apply himself to the study of medicine and in the autumn of 1717 went to live in "... the House of Mr Bakewell, apothecary at the corner of King Street, Cheapside, for the advantage of acquainting myself with medicines, prescriptions and practice."

1848

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Review.

The Three Lieschings. Their Times and Contribution to Cape Medicine, 1800–1843. Patricia McMagh.

Cape Town. 1992, The Society for the History of Pharmacy in South Africa, pp. 186, illustrated, pedigree. £17.00.

In essence, this book is an excellent family history dealing with the first two generations of the Lieschings to live in Cape Town,South Africa. The story starts in the Duchy of Württemberg with the birth of Friedrich Ludwig in 1757, and with many interesting diversions and asides, relates how he obtained his medical training at the *HohenKarlsschule* in Stuttgart. At the Schule, the brain-child of the Duchy's autocratic ruler, Duke Karl Eugen, the education was without doubt first class, but in return the student lost all right to arrange his own life. Amongst the Duke's many activities, he raised a regiment which later he was to sell to the Dutch East India Company. Thus *Das Württembergische Kapregiment* with its Surgeon-major F.L.Liesching duly arrived in Table Bay on 12 December 1787, neither to return to their native land.

As the author has written, there is another facet to the book beyond that of the private lives of Friedrich Ludwig and his immediate descendants, namely the professional lives of the father and two of his sons. Carl Ludwig Wilhelm, known as Louis, (all eight children were blessed with these resounding names) who had been born in Germany returned there for the purpose of gaining an M.D. from the Hanoverian University of Göttingen, whilst the youngest son, Carl Friedrich (known as Charles) became a pharmacist; with the latter an interesting piece of pharmaceutical history unfolds.

The Cape of Good Hope became a British possession for the second time in 1806, and in the April of the following year, the first Medical Proclamation initiating statutory control was made. It stated that in future all medical personnel, whether physicians, surgeons or vendors of medicines, had to appear before the Supreme Medical Committee with their diplomas proving their qualifications. If they were unable to produce them then they would be examined as to their fitness to practise. The Committee was also to visit all pharmacies at least quarterly in order to examine all medicines and drugs, and were to destroy those which were sub-standard. Furthermore, Laudanum, Opium, Arsenic "and other powerful Medicines" were to be kept in a secure place, and none were to be sold in dangerous quantities. These conditions were far beyond any to be found in Britain at that time.

Not content with this, a second Proclamation was made the following August which is of particular interest to pharmacy. "I do hereby most strictly forbid any Physician or Surgeon from keeping any Medicines whatsoever for the use of his patients...." In theory this should have proved a problem for Dr F.L.Liesching. In November 1800, he had advertised that he was opening an apothecary shop or pharmacy in Loop Street next door to his home and medical practice. The doctor was by no means averse to trade because, both earlier and later, he sold general merchandise by auction. The Medical Committee did not care for this "multiple practice" and said quite bluntly (p.91), "Dr Liesching ought to quit all concerns of the shop or lay aside his diploma ... such a combination in a large city is not only disreputable to the character of the physician, but injurious to the regular apothecary, and not infrequently to the patient ... At present Dr Liesching engrosses every branch of the profession (surgery excepted) and trade, wholesale as well as retail." The doctor took not the slightest bit of notice of the Committee's views.

Unhappily this notable early attempt to separate the professions of medicine and pharmacy was not enforced. Authority was flouted with apparent impunity as is obvious in the Third Medical Proclamation of 1823 which stated, "It having been a prevailing custom in this Colony for the Physician and Surgeon not only to prescribe but to prepare Medicines themselves for their Patients to the manifest injury of such Patients, who in most cases are thereby neglected, only receiving their Medicines at night, such custom is in future to be discontinued...."

Exactitude in terminology is important when discussing pharmaceutical history. The author is unclear in her usage of the term "apothecary" which leads to a degree of confusion. At times she believes it to refer to a chemist and druggist or pharmacist, whilst at others she thinks it is applied to a general practitioner. The latter was of course the case in early nineteenth century England, but in Cape Town one suspects the title was much closer to the Dutch "apotheker" or pharmacist. This variation in meaning in the two languages for a very similar word has led others into trouble, not least perhaps the redoubtable and abrasive Dr James Barry who had a monumental quarrel with the Liesching family when son Carl Friedrich wished to be registered and licensed as "Apothecary, chemist and druggist" in 1824. In England by that date the titles, "apothecary" and "chemist and druggist" were not interchangeable.

The book has many unusual illustration although poorly reproduced, there is a useful bibliography, a limited amount of referencing, but unfortunately no index. Typographical errors are delightfully infrequent. The book is an excellent "read" giving a fine picture of the early days in Cape Colony and the developing medical scene.

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DIOSCORIDE VITALI AND CARLO ERBA - TWO KEY FIGURES IN NINETEENTH CENTURY ITALIAN PHARMACY.

Dr David B. Jack.

Introduction.

The history of pharmacy and the developments that gave rise to the modern pharmaceutical industry are well documented in a number of Western European countries, particularly France, Germany and Great Britain. This is less true of Italy, one of the reasons being that until well into the nineteenth century it was still largely a collection of city states with the citizens owing their allegiance to a local king, duke or the Pope rather than to a central authority. Among the last few states to become part of the Italian Republic, formed with the help of Garibaldi under Victor Emmanuel II in 1861, were Venice and Rome, the latter not joining until 1870. Even today many Italians consider themselves first Venetians or Florentines for example, and Italians second.

Modern Italy has developed differently from many other European countries and in the country itself the division between the highly industrialised North and the under-developed South, with the central government in Rome separating the two, is well known. Some countries have an almost group mentality while others are emphatically collections of colourful individuals: Italy belongs to the latter and is justly proud of it. I would like to describe two Italians who made very important and substantial contributions to pharmacy in the nineteenth century in their own country and far beyond. These contributions have not received the recognition they deserve and it is my aim here, at least partially, to rectify this.

A number of years ago when I was involved in drug research and in particular drug analysis, I became very interested in the spot tests used for the identification of alkaloids and other organic bases. Most of these were developed over a hundred years ago and a number are still used today by toxicologists and forensic chemists for the identification of "unknown" compounds, often in the form of spray reagents for thin layer chromatography. Each of these tests bears the name of its inventor.(See Table I) I carried out a considerable amount of research to discover where most of these individuals worked, although detailed biographical material is still scarce in some cases. A summary of this information is given in Table II. Many of the tests were devised by Germans or Baltic Germans, particularly from the University of Tartu, or Dorpat as it was then called, in Estonia. Only one of the tests was developed outside northern Europe, and that was by the Italian, Dioscoride Vitali. This was only one of the many important contributions he made to pharmacy in his long life.

Table I.
Named Reagents for the identification of Alkaloids and other bases.

Name of Inventor	Type of Compound.
Dragendorff	Alkaloids, general bases.
Marquis	Morphine, codeine, general bases.
Mandelin	Alkaloids, general bases.
Vitali	Atropine group.
Froehde	Morphine group.
Marmé	Cocaine and related bases.
Mecke	Morphine group.
Otto	Strychnine.
Husemann	Alkaloids.

Table II.
Biographical details of the Reagent Inventors.

Name	Born	Died	Worked.
Dragendorff	1836,Rostock	1898, Rostock	Tartu (Dorpat)
Marquis	1868,Riga	?	Tartu(Dorpat)
Mandelin	1854,Joensu	1906,Vasa	Finland.
Vitali	1832, Cortemaggiore	1917,Venice	Bologna
Froehde	1830,Luckau	?	Berlin
Marmé	1832,Dierdorf	1897,Göttingen	Göttingen
Mecke	?	?	Szczecin
Otto	1809,Grossenhayn	1870, Braunschweig	Braunschweig
Husemann	1833,Hannover	1877,Thusis	Göttingen.

Dioscoride Vitali, the soldier pharmacist.

Vitali was one of a family of fourteen children and was born in the small town of Cortemaggiore, which lies to the south of Milan near Piacenza, on 25 May 1832. His father is recorded as being a jurist and archaeologist, and Vitali was keen to follow in his footsteps by becoming a lawyer. However, since mid-nineteenth century Italy was a turbulent place and much of the political intrigue was being fomented by the legal profession, it was thought more prudent to pursue different studies when he enrolled at the University of Parma. How much pressure his family put on him is unknown for he was very interested in politics and fell foul of the authorities more than once; on several occasions he was almost killed fighting for his beliefs.

He was a gifted student and when he graduated in 1854 his mentor, Professor Truffi, predicted that he would be a professor himself one day. Vitali, however, was in search of danger and excitement which was not hard to find in Europe at that time. He enlisted in a brigade of volunteers then being recruited in Turin to take part in the Crimean War to fight alongside the Turks, French and British against the Russians.

The war ended in 1856 before Vitali could take part in

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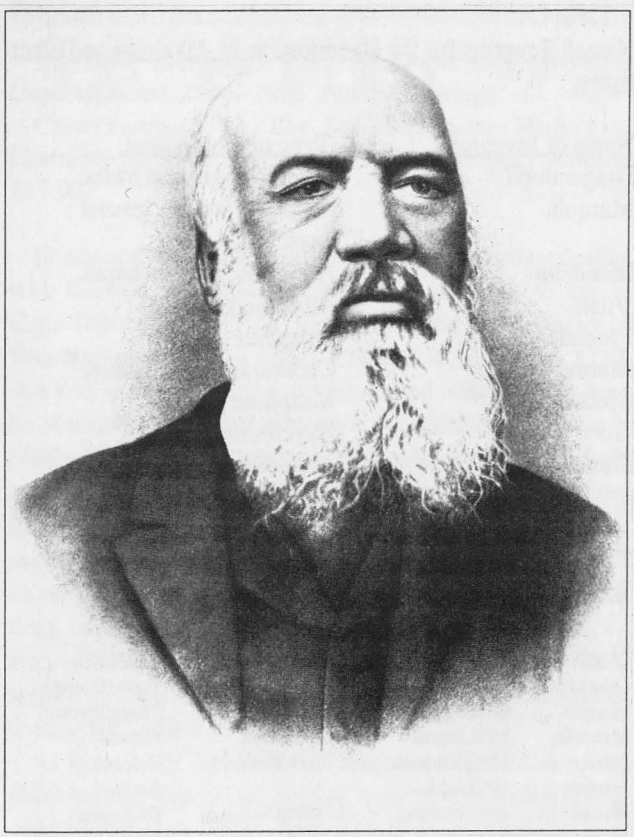

Dioscoride Vitali

any actual fighting but, nevertheless, he was in trouble with the authorities in Piacenza because he had enlisted in a foreign army. He spent some time exiled in Turin until there was a general amnesty which allowed him to return home. Once back in Piacenza he decided to buy a pharmacy in the town, but left soon after to fight alongside Garibaldi in the struggle to free Italy from foreign rule.

He went back to Turin in 1859 with a band of other "Piacentini" to join the Alpine Brigade, the Compagnia di Cacciatori delle Alpi, and was soon in the thick of the fighting. He displayed excellent qualities as a leader and was near death on several occasions.

The armistice of Villafranca (Verona) in July 1859 was concluded between France and Piedmonte on one side and Austria on the other. Vitali decided to return home having declined the offer of a regular commission in the "Alpini". He found his pharmacy in a poor state of repair and sold it before applying for the post of assistant director of the hospital pharmacy at Piacenza. While there he graduated in chemistry and pharmacy and carried out research in a wide range of subjects, including clinical pharmacy, pharmaceutical chemistry and toxicology.

Vitali's Academic Career.

In 1863 he accepted a post as assistant in general organic chemistry at the University of Bologna. At that time the chair was held by Professor Pietro Piazza, the author of one of the standard Italian texts on organic chemistry, Lezioni di chimica organica e chimica animale. The university post can not have been too demanding because Vitali also found time to carry out the duties of pharmacist at the military hospital in Bologna.

He returned to Piacenza in 1867 to take up the post of chief hospital pharmacist where he stayed for over twenty years. This was a very fruitful period for him and he maintained his interest in research, becoming editor of the Bollettino Chimico Farmaceutico in 1878.

Francesco Selmi, the professor of pharmaceutical chemistry at Bologna, died in 1881 whereupon Vitali was invited to take the post. He accepted and devoted the next 25 years to teaching and research in pharmacy and toxicology. He retired in 1908, aged 76, and died in Venice on 10 March 1917. His epitaph was written by the celebrated poet Gabriele D'Annunzio.

Vitali had been an active researcher throughout his professional life. Although his name is best known internationally for his tests for alkaloids, it was also associated with methods for the detection of chloroform and pus using a tincture of guaiacum resin. The Vitali test used by toxicologists is a simple one in which the material is treated with a drop of fuming nitric acid, evaporated to dryness, and a drop of alcoholic potassium hydroxide added. An intense blue-violet colour develops if any alkaloids of the atropine group are present. The test has a sensitivity of about 1 ug of atropine; different colours are produced by colchicine, veratrine and cystine.

Several preparations of his own manufacture were presented at international exhibitions, as in Vienna in 1872 and Paris in 1877. His work in hospitals had obviously stimulated his interest in fluids such as blood, urine and pus, and in 1878 he was appointed to the commission investigating the relics of Saints Antonino and Vittore. He was able to show that the material contained in a vesel dating from the fifteenth century actually was blood.

Together with his test for atropine alkaloids, Vitali's greatest contributions to pharmacy were his many textbooks, some of which went into several editions. These covered such diverse topics as the composition of urine, chemical theory, forensic chemistry and toxicology. During a very active life he was also a founder member of the Italian Pharmaceutical Society and edited the Italian Pharmacopoeia which celebrated its centenary in 1992. His last major work, published in retirement in 1912 when he was 80 years of age, was fittingly a treatise on pharmaceutical chemistry – a topic to which he had devoted his entire life.

Carlo Erba, the industrialist.

Carlo Erba, another northerner, was born at Vigevano, an ancient town famous for silk manufacturing just west of

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Milan, on 17 October 1811, the eldest of five sons born to Antonio and Caterina Erba. When Carlo was still young the family moved to Milan where his first contact with pharmacy was in a shop managed by his father in Vicolo Calusca opposite the church of St. Eustorgio.

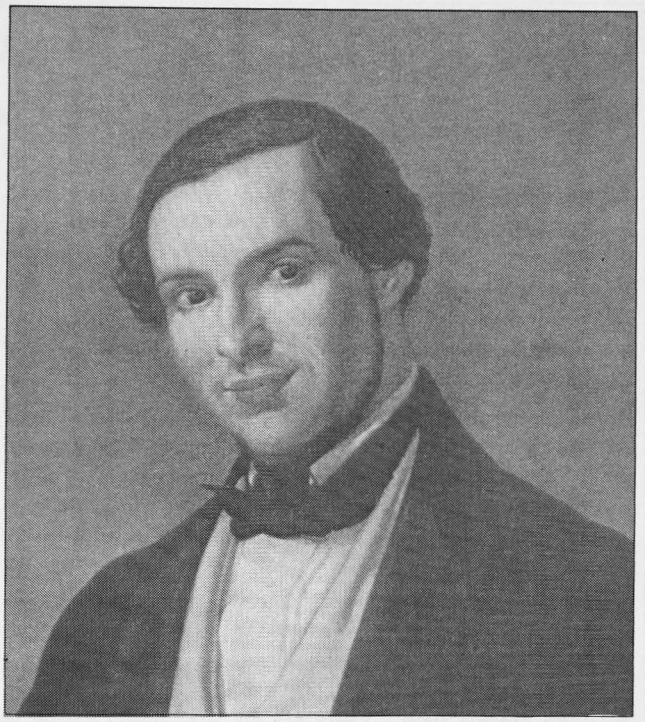
He studied at the University of Pavia, and graduated with first class honours in 1834, having served an apprenticeship in the local Grammatico pharmacy in Vigevano. He spent a further three years in the Bonifacio pharmacy in nearby Pavia, and then used his savings to take over the Brera pharmacy in Via Fiori Oscuri, Milan in 1837. At that time business was bad. He wrote in his diary, ''... I found it in a sorry state because for a long time it had ben in the hands of unskilled staff and, in the hope of regaining lost credit, I set to work with a will.''

He became interested in the production of a range of materials including quinine and valerianic acid as well as a number inorganic compounds such as bismuth salts, iodides and a magnesia preparation. The last of these was to generate a great deal of income for the company in later years. In 1843 he developed a method for encapsulating medicines in gelatin which sold extremely well despite being expensive. He was keen that his pharmacy should show an example to others and around 1850 started work on a project to improve his method of producing tamarind extract. At that time the procedure used was a lengthy one involving boiling which had an adverse effect on the flavour. Over the next ten years he devised a more efficient vacuum extraction which could be performed at a much lower temperature. He also conducted research involving hydrocyanic acid, ferrocyanides, gold and silver salts, bismuth potassium tartrate and morphine.

Carlo Erba as pharmaceutical manufacturer.

Manufacturing in Italy in the mid-nineteenth century was still very primitive in comparison with France, Germany and Great Britain due to lack of capital, restrictions on internal markets and unhelpful legislation. As far as pharmaceutical products were concerned, almost all of these were imported from France and were extremely expensive. Any Italian pharmacist wishing to export his products to France faced great difficulties. Erba described them in his diary as ''...a barrier higher than the Great Wall of China''. However, he was able to get round the regulations and sell one of his products, pepsin, in France by describing it as a food.

He decided that the way forward for his business was to switch to mass production. His company, Carlo Erba SpA, came into being in 1853. He installed a 5hp steam boiler and engine in the laboratory next to the pharmacy, and with this, his became the first mechanised laboratory in the country. He spent the next three years building up his business, solving teething problems associated with the new equipment and his own admitted lack of experience. His first major success was the completion of the new system



Carlo Ebra

for vacuum extraction of tamarind which preserved the full flavour of the original.

In 1861 he was able to buy a large site for development in the Via Marsala, and three years later his first large scale plant was in production. Among the materials produced and sold all over the world were extracts of quinine, rhubarb, jalap, liquorice, ipecac, cream of tartar and gum arabic. He continued to expand and the catalogue of 1878 lists almost 1,800 items including, in addition to chemicals and pharmaceuticals, animal feedstock and baby food.

Although not necessary on strictly commercial grounds, in 1879 he opened a shop in the Piazza del Duomo, Milan, in order to give his business a higher public profile. By this time Carlo Erba had become a very successful businessman and was a leading industrial figure in Italy. He was a shareholder in the Banca Industriale, Ricordi, the spinning works Cascami di seta and the Barthe munitions works. He became a founder member in 1883 of the Edison group which was to play an important role in modern Italy.

Erba the philanthropist.

In addition to his manufacturing activities, Carlo Erba was involved in a variety of philanthropic activities. For example, with fellow industrialists, Pirelli and Gondrand, he invested in a trading company in Africa to exploit commercial opportunities there and supported the work of Cesare Lombroso in his pioneering research work on pellagra. At home he initiated a scheme for the education and training of his workers as in mid nineteenth century Italy about 80% of the population were still illiterate. He also made a large

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financial contribution to the setting up of an electro-technical institute as part of Milan Polytechnic.

This busy and far-sighted man died of a heart attack in Milan on 5 April 1888.

The Company.

Carlo's youngest brother, Luigi, took over the running of the company and new plants were opened on the outskirts of Milan and in the province of Parma. By the end of the century, the company had a very strong presence in overseas markets, particularly in South America. It survived the two world wars, continuing to expand and merged in 1978 with another large pharmaceutical firm, **Farmitalia,** to become **Farmitalia Carlo Erba,** now the largest manufacturer of pharmaceuticals in Italy.

As well as retaining the name in the title of the company, "Carlo Erba" can be seen on equipment sold by them, such as their series of gas chromatographs. In 1983 the company became part of the gigantic **Erbamont N.V.** holding and is active in a number of areas including oncology, cardiovascular and infectious diseases, and neurological disorders. It employs over 6,500 staff, with a third of them working outside Italy. There are six production plants in Italy and another six overseas.

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Acknowledgments.

I should like to thank Norman Lauritsen, Farmitalia Carlo Erba Ltd. UK, for his kind assistance and use of material relating to the life of Carlo Erba.

WILLIAM STUKELEY (M.D.Cantab.) AND THE APOTHECARIES.

Dr J. Burnby.

Introduction.

Any history of medicine in England will relate that the position of the apothecary, professionally, economically, and above all, socially was far below that of the physician. The physician was a gentleman, the practitioner of a highly respected profession, whilst the apothecary was a member of the lowly shop-keeping class, ill-educated and uncultured. That these two branches of the medical profession should have social contact or, still more unlikely, inter-married is regarded as unlikely in the extreme. Peck and Wilkinson, writing in 1950, said that a "gentleman-apothecary" was impossible and found it most unusual that William Withering's father, Edmund, should have married the sister of Dr Brooke Hector M.D. of Lichfield.[1]

This traditional view that the social worlds of the physician and the apothecary were far apart has of recent years been questioned. Sir George Clark noted, when discussing the separation of the Apothecaries from the Grocers' Company in 1617, that Dr John Argent M.D. and future president of the College of Physicians was brother-in-law to an apothecary, Gideon Delaune, who "...was a rich and influential citizen around whom legends grew", and though his case might be "... exceptional it was not unique...there was no complete social gulf between the two 'faculties'".[2] R.S. Roberts in a fine account of medical practice in Tudor and Stuart England came to the conclusion that, "In Exeter there was close and friendly contact between almost all apothecaries and physicians."[3] Rooke and Newbold in their detailed study of the medical personnel of Cambridge in the sixteenth and seventeenth centuries found that the background of the physicians and apothecaries was remarkably similar; that they were often close friends and frequently helped each other with the administrative and legalistic problems of life and death.[4]

In fact the apothecaries were a part of that burgeoning stratum of society from which the professions were to spring and grow in size, prosperity and influence. Geoffrey Holmes in his work on the early years of the professions noted the close family link to be found between those who entered the Church and those who became apothecaries.[5] The Tristrams of Belbroughton are a particularly good example of this.

The Reverend Thomas Tristram, after Balliol College, Oxford, became rector of Belbroughton, Worcestershire, until his death in 1640. He was followed in this position by his son Richard, son of his first marriage, who was incumbent for fifty years. Andrew, the son of Thomas's second marriage, became vicar of Clent and Andrew's brother John obtained in 1661 a licence to practise medicine from the Bishop of Worcester.

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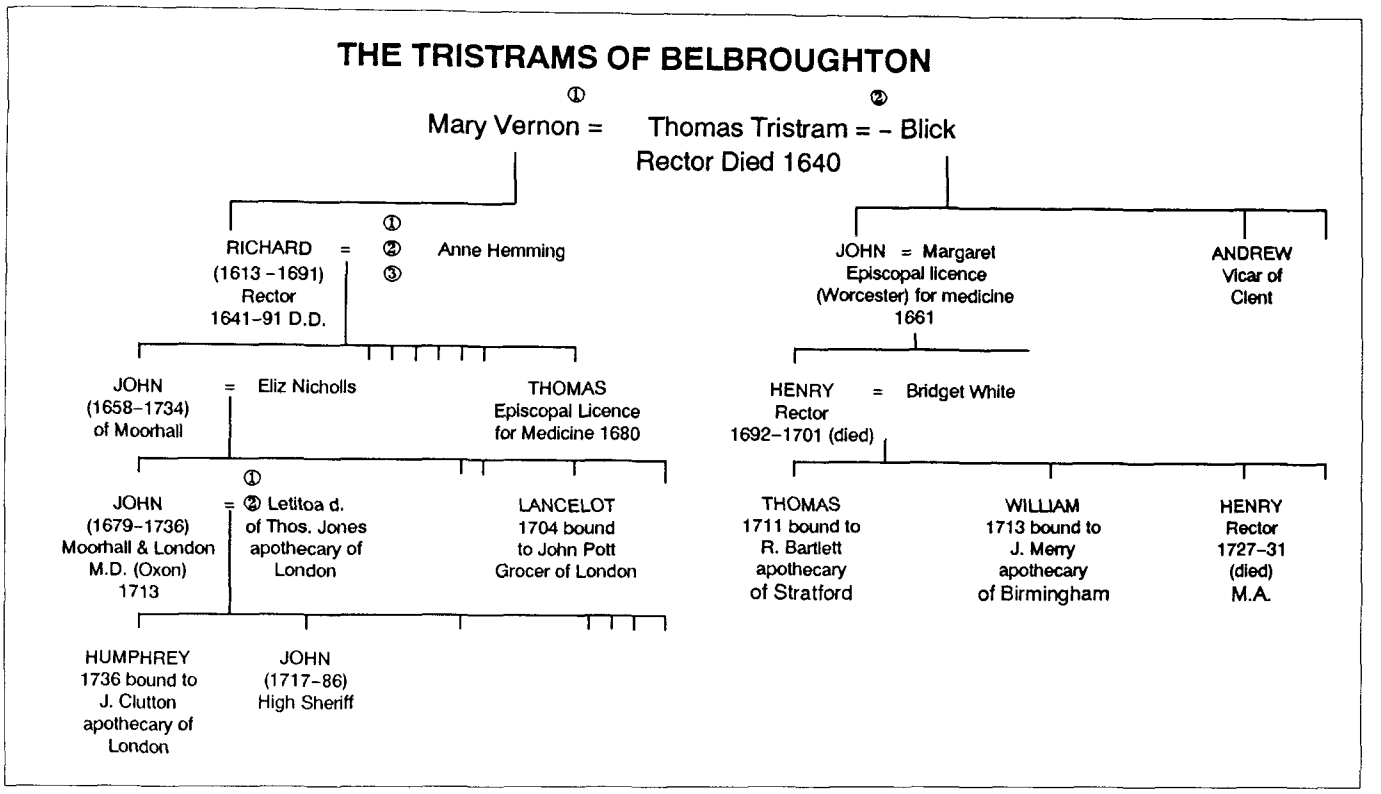

In the next generation, the rector's eldest son joined the minor landed gentry at Moor Hall, but another son, Thomas, was also given an episcopal licence to practise medicine. The rectory was not however allowed to pass out of the family, but was now in the hands' of Richard's half-brother's son Henry. This Henry when it came to putting his sons, Thomas and William, out into the world had them apprenticed to apothecary surgeons in Stratford-on-Avon and Birmingham, whilst the rectory was retained for his third son, also Henry.

Running parallel with these events, John the landed gentleman, sent his eldest son, John, to University College, Oxford, where in due course when he was 34, he was awarded an M.D. Another son, Lancelot, was bound in 1704 to John Pott, citizen and grocer of London, possibly a druggist but sometimes described as an oilman.

The physician, in the year of his death in 1736, apprenticed his son Humphrey to a well known London apothecary, Joseph Clutton, Worcestershire gentleman, convert to Quakerism and the real founder of the famous firm of Corbyn and Stacey.

Thus in this pedigree of the Tristrams followed through some 150 years and five generations, we have four rectors, one vicar, a merchant, two episcopal licensees, a landed gentleman and three apothecaries.[6] Where one may ask was this great social gap between physicians who were gentlemen, and apothecaries who were deemed to belong to the "lower orders"?[7]

An examination of the life of William Stukeley (1687–1765), antiquarian, physician and clergyman, will serve to reinforce the challenge to the conventional view.

Stukeley's early years.

Stukeley wrote in his *Family Memoirs* that his forebears had originally lived near Great Stukeley, Huntingdonshire, but that for several generations their interests had been in Lincolnshire.[8] John Stukeley, William's grandfather, although born in Holbeach in January 1623 lived most of his life at Uffington, close to Stamford on the Great North Road. He was a man of ready wit and charm which was a great asset to his social life but was equally detrimental to the running of the modest family estate,

It was planned that the elder son, Adlard, should become an attorney and he was duly articled, but John the younger one was, "...to be brought up in the Country business and Grazing", no doubt with the hope that he would put the neglected estate to rights. This however was not to John's taste, and William claims that, aided and abetted by his step-mother, he secretly continued his education at the grammar school in Stamford. When he was seventeen, John's father died whereupon John was taken as a clerk into his brother Adlard's law business in Holbeach. The two brothers

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practised together as attorneys, both in that town and in London.

At the end of May 1686 the 28 year old John Stukeley married Frances Bullen, a handsome girl of seventen. It proved to be a happy marriage. Their first child, William, was born in November 1687 to be followed by four more sons and five daughters, five of the children dying in infancy. Less than twelve months after John's marriage, Adlard, after announcing for years that he would not marry because of his poor health, followed suit, and poor health notwithstanding, fathered eleven children with a slightly better survival rate than those of his brother.

William Stukeley's *Memoirs* give a good idea how a bright, inquiring boy living in a small market town at the end of the seventeenth century could obtain a widely-based education. "I learnt the first Rudiments of Letters of Mrs Collingwood, an old decay'd Gentlewoman at Holbeach who taught all the children in the Parish, and in 1692 I was put to the Free-School at the Church there....The Ma[ste]r then was the learned Mr Edw. Kelsal who in 4 years time left us for the School at Boston and afterwards became Vicar there, and dyed last summer.[1719] To him at Holbech succeeded Mr Wm. Smith about 1696, a Leicestershire Gent....In 1694 I learnt to write of Mr Colman who taught us in the Quire of the Church. He had a mighty knack of drawing with his Pen, which Incited my natural Inclination that way, & I was ever after endeavouring to divert myself in it, and generally carryed the bell from my Cotemporary Imitators. Whilst I was a schoolboy I learnt to dance of Mr Butler among the other young Fry of the Town, and my Fa[the]r engaged Mr Smith, our Schoolmaster to teach me to play on the Flute, and I found it serviceable to my health, that gentle exercise, strengthening my lungs which were naturally weak.... I used to goe a simpling with Mr Ascough, apothecary, in the Town, into Fleet Woods, & knowing a pretty many plants, layd I believe, the Foundation for my Inclination to the study of Physic in that early age."[9]

Young William liked to listen surreptitiously to the discussions held between his father, Mr William Belgrave (a local wealthy landowner who had been to Oxford University) and the schoolmaster, particularly when they discoursed on astronomy. Astrology still had its adherents for we learn that William conversed frequently "...with the Parish Clerk, William Pepper, a tenant of my Fa[the]rs who taught me something of the use of the Quadrant, and Dialling, and some Astrology withal, so that I could take the height of a steeple, & readily erect a scheme of twelve houses, and was very fond of the art, till the University corrected my Judgment in these matters. Mr Brampton, organist of Sutton, a mathematician, us'd to be with my Fa[the]er some time and I was mightily delighted with his company; he had a knack in Astrology & Physiognomy...but he did not acquaint me with the rules of his art."

When he was thirteen, William was taken to London by his father to be initiated into the mysteries of the legal profession in his chambers at Staple Inn, but the law did not appeal to him.Three years later, in 1703, he went up to Cambridge to Benet College with the intention of studying medicine.[10]

Life at Cambridge proved full of interest for him and he threw himself into it with enthusiasm. He still went simpling and in the winter of 1705 attended the lectures of Vigani. John Vigani (c.1650-1713) came from Verona in 1683, and after teaching chemistry at Cambridge for some twenty years, became the University's first professor in that subject in 1703.[11]

Soon, however, crushing responsibilities were thrust upon young Stukeley with the news in February 1706 that his father had died in his chambers in London when but 49 years of age. Only three weeks later, in the same bed, William's Uncle Adlard died. It was then discovered that the financial affairs of the two brothers were far from sound. Happily, as William wrote, his mother was "a woman of great sence & dexterous in Managing business", so that she was willing and able to send him back to Cambridge in May.

In the long vacation he caught smallpox which pleased him greatly, as having his future profession in mind he thought it was as well to have it at a convenient time! His sister and two younger brothers were also laid low; Adlard and Frances, like himself, made good recoveries but seven year old Robert died. "My mother took great pains to remove all my books and prevent my reading for fear of prejudicing my Eyes. So I got some boxwood and cutt a pretty little sceleton out of it, about 6 inches long, where every bone was very distinct in situ and formed. I gave it afterwards in a Case to Mr Breaknock, my apothecary at Holbech, and it is now in his shop."

James Brecknock (1681-1746) was born at Weston St.Mary, Lincolnshire, the son of the vicar of that parish and his wife Mary Fleming. He was probably apprenticed to James Ascough, apothecary and chyrurgion in Holbeach, and to whose practice he succeeded on Ascough's death. Brecknock had a number of apprentices, one of whom,Daniel Naylor, died during his training; another, Thomas Sturton of Sleaford, followed Brecknock in his Holbeach practice. William Stukeley and James Brecknock were close enough friends for William's father to relay to his son at Cambridge in a letter gossipy details of the love affairs of the family into which James had married.[12] They remained life-long friends.

Just over a year after his father's death, William was to lose both his mother,aged 39, and his brother aged seventeen. On the death of his father, John had been "put out" as a clerk in St. Ives,Huntingdonshire, which had proved a costly business. William wrote of him, "[He was] a sharp lad of good parts but was no scholar - he was an admirable clerk

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and would have been notable in his profession." Stukeley's finances were by now in such a parlous state that he had to sell all the household goods and the plate at Stourbridge Fair, and let his house to Mr Topham the local lawyer. His sister, Frances, he placed with a good friend of the family, John Rix. Rix was a mercer and chandler in Holbeach and in 1714 Sarah Stukeley, Uncle Adlard's widow, apprenticed her fifteen year old son Robert to him for seven years; the premium was £60.[13]

Having settled his affairs as well as he could and his own precarious health being improved, Stukeley returned again to Cambridge. His interests in chemical experiments, dissection and simpling continued unabated.[14] "I continued to be present at Seignior Vigani's Chymical Lectures, and this time went through a Course of Materia medica with him. I was a particular Favorite of his, and often visited him and received his visits again. I visited the apothecarys shops to make my self perfect in the knowledge of Drugs, and Officinal Compositions, and exercised a little Gratis Practise among the poor people that depended on the College....In my own Elaboratory I made large quantitys of Sal volatile oleosum, Tinctura Metallorum, Elixir Proprietatis and such matters as would serve to put into our Drink."

Stukeley as physician.

He gained his Bachelor of Medicine late in January 1709 and returned to Holbeach where he lodged with his sister Frances, now ten years old, at Mr Rix's. In June he went to London to finish his medical studies, "...to see the method of the Hospitals there", and put "himself under the eye of Dr Mead then Physician to St. Thomas's"[15] The following February (1710) he was once more in Holbeach living with John Rix whilst he investigated the possibilities of setting up in practice. Nearby Boston had a number of advantages for him, so he moved to that town on Mayday.

His last surviving brother, Adlard, was at that time being educated at Moulton under Mr Staunton where Uncle Adlard had also been a scholar. In February 1711 young Adlard came to live with William "...at Mr Arnals, and designing to be an Apothecary he studyd the Rudiments of Pharmacy there."[16] Later on Adlard was bound apprentice to a Mr Cooper of Northampton and in 1722 received a Bishop's Licence to practise as both doctor and surgeon.[17] Unlike the case of the Massey brothers, it does not seem that William took much part, if any, in the training of his brother. Richard Middleton Massey (1678–1743) a friend of Stukeley's, went to Brasenose College, Oxford in 1697 but was unable to graduate as he was a non-juror. However whilst living in London for about three years, he received instruction from Sir Hans Sloane. By 1704 he had settled in Wisbech, and two years later having become an extra-licentiate of the London College of Physicians, he practised as such. He was joined in 1710 by his much younger brother Samuel, (1694–1773) to learn the "Practice of Physic". Ten years later Samuel purchased the practice of Lawrence Banyer, Wisbech's highly respected apothecary, by which time Richard had been awarded an M.D. of Aberdeen.[18]

There is no doubt that William Stukeley was an example of what Samuel Johnson called "very clubbable men", and was in his lifetime involved in the founding of a number of societies, lodges and clubs. Once he was established at Boston, he relates that in May 1711, "I erected a botanic Club. The Apothecarys and I went out a simpling once a week. We bought Rays three folios of a joint stock." He was an early member of the Spalding Gentlemen's Society founded in 1710 by Maurice Johnson of Ascoughfee Hall, Spalding, and the Inner Temple, a friend of Boerhaave. Its members were particularly interested in antiquities but "We deal in all arts and sciences, and exclude nothing from our conversation except politics, which would throw us all into confusion and disorder."[19] Maurice Johnson was a relative by marriage to James Brecknock's wife so it is not surprising to find that Brecknock too was a member of the Society, as was his apprentice Heneage Brown.

After a few years in Boston, Stukeley determined to try his fortune in the capital and went to London in 1717. Professionally he progressed rapidly, obtaining his M.D.(Cantab.) in 1719 and becoming a Fellow of the College of Physicians the following year. He was a founder member in 1718 of the Society of Antiquaries of London of which he was secretary for nine years. On the proposal of no less a person than Sir Isaac Newton he was elected to the council of the Royal Society and was one of the committee for examining the astronomical instruments at the Royal Observatory.

In the midst of this busy and exciting life he did not forget his friends the apothecaries. In July 1720 he took part in the herbarizing expedition and feast at Greenwich of the Society of Apothecaries. He was still keenly interested in simpling, at the same time becoming a competent field archaeologist. In the late 1960s five of his drawings came to light which had been made between November 1723 and May 1725 of sites in London and Middlesex. One, which has been identified as that of a mound on Parliament Hill, has a caption which he added in about 1750, "This is a tumulus on an eminence by Caenwood which I drew out on Mayday 1725 where we always went a simpling in the years I lived in Town formerly. Dr Wilmore now of Chelsea & Botanic professor in [the] Apothecarys garden commonly with me."[20] John Wilmer (1697–1769)was an apothecary who in April 1748 was appointed Demonstrator of Plants at the Chelsea Physic Garden which belonged to the Apothecaries' Society, in succession to another well known apothecary and botanist, Joseph Miller.[21] Wilmer was granted an M.D. of King's College, Aberdeen on 9 September 1745, his two supporters being John Beauford and Francis Douce, physicians.

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Stukeley took part in dissections too for he writes in his common-place book on 1 November 1724, "We, Mr Sayer, and Mr Prude, apothecary, open'd the body of a woman 10 weeks before she was to lye in."[22] George Sayer was a well known surgeon, a member of the Barber Surgeons' Company of London, who could obtain as much as £120 premium for his apprentices. Henry Prude, son of John Prude of St.Clement Dane's, London, after an eight year apprenticeship with the wealthy and important London apothecary, Richard Chapman, was made Free of the Society of Apothecaries in 1721. His portrait is to be seen at the Society today.

Stukeley goes to live in Grantham.

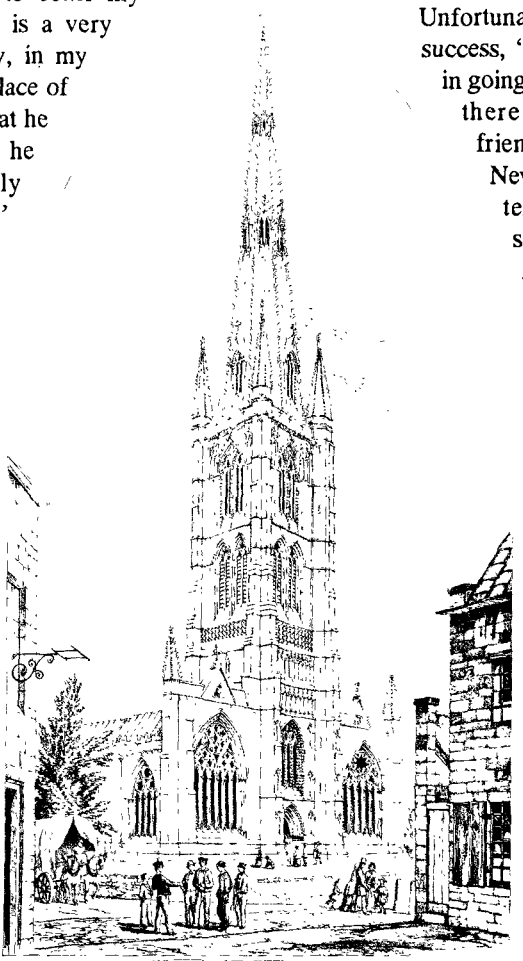
In his diary on 22 November 1725 William noted, "Mr Chrichlo of Grantham dy'd. My Bro[the]r succeeded." John Crichloe had been granted a licence in February 1710 to practise medicine and surgery in the diocese of Lincoln, a licence which Adlard had also possessed since 1722. It was this success on the part of his brother which finally decided William to leave London for a life in the country believing the air and exercise would check his "gout". He had, as he described it, "... a most intire love for the country life and always design'd it, hoping to better my fortune first some way. Grantham is a very pleasant place in a very fine country, in my own county and near my estate and place of nativity at Holbeach." He thought that he would now probably marry - which he did when he was, as he carefully recorded," 40 years & 1 month old" at Barston.[23] His bride, Frances, daughter of Robert Williamson, gentleman and of "a family of fortune" was, as he unchivalrously noted,"31 years and 3 months."

His friend of many years standing and a fellow antiquarian, Roger Gale, whose sister was to become the second Mrs Stukeley, wrote a letter of congratulation to him and commented that William would have "her company in your studys; for nothing less can be expected from a lady educated by Mr Mattaire", a well respected classical scholar. Frances was admitted a member of the Society of Roman Knights, a body founded by Stukeley in July 1722 for the study of Roman Britain. Tragically this intellectual companion and wife, a combination all too rarely found in the early eighteenth century, died on 1 September 1737 after bearing him four children, all girls.

Sixteen months later he married again. Elizabeth Gale was said to have been a beauty with a not inconsiderable fortune but apparently proved to be a far from congenial help-mate. Whitaker wrote that Stukeley,"found more enjoyment in the company of a brother-in-law than in the charms of a wife. Stukeley, it is well known, married Discord, personified in the sister of his friend."[24]

William's brother had married at a much younger age in August 1721 to an Elizabeth Knipe at Londonthorpe, near Grantham. William relates that Elizabeth was the niece of Richard Wiseman (1622-1676), serjeant-surgeon to Charles II, and an innovative surgeon of considerable renown. "He lived in the old stone house with a great arched gate, the second on the right hand as you enter the High Street, on [the] great northern road at Grantham. He was buryed in Grantham church. The Knypes inherited his estate, descended from his sister."[25] Adlard and Elizabeth had a family of ten children, the eldest son, William, following family medical tradition by becoming a "surgeon to the Kings troops". He visited his Uncle William en route for London, "to go with Admiral Boscawen and 16 sail of men of war and East Indiamen to retake Madras."

Unfortunately the move from London was not a success, "I found, I committed an original error in going to Grantham, because my brother living there for one commonly finds less of friendship among relations than others." Nevertheless the brothers remained on good terms because William preached the sermon at Grantham in 1744 when Adlard was elected Alderman there.[26]



Grantham, early 19th century

Stukeley as clergyman.

Stukeley now forsook the practice of medicine. He had hoped for the quiet life of a country gentleman in Grantham but it was not to be. He had not ben there long when the local physician, Dr Green, died so that against his will William's practice was increased bringing with it "...night calls and professional worries etc." Now the uneventful life of the eighteenth century clergyman of the established church appealed to him and he was ordained on 9 November 1729. Soon afterwards he became rector of All Saints, Stamford.

In many ways Stamford proved scarcely more successful than Grantham but he wrote that he believed that, "providence had intended him to

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go there and so propagate his parishioners Dr Rogers Cure." John Rogers was an apothecary in Stamford, the son of an apothecary in the same town, where both men were elected Mayor. The younger man invented a preparation which he called "Oleum arthriticum" and claimed to have used it with success on himself and others. Stukeley, who had suffered from "gout" since he was sixteen, tried it and pronounced that it had "saved his joints" to such a degree that he had "recovered his limbs and health". In 1733 he published an account of these rubbing oils in a letter to Sir Hans Sloane which gave the preparation considerable publicity. One of Rogers' apprentices was to rise to the heights of becoming a Royal Apothecary, and one wonders if John Truesdale took the secret of the oils with him for the royal household.[27]

John Rogers had already in 1722 obtained an episcopal licence to practise medicine but now was encouraged sufficiently to try for a Doctorate in Medicine from a Scottish university, the usual prelude for a man who now wished to practise as a physician and leave his apothecary's shop behind him. In April 1736 he was duly awarded an M.D. from Marischal College, Aberdeen, his recommenders being John Hanys M.D., Tancred Robinson M.D.,FRS, a man of great erudition, and of course William Stukeley.

In April 1743, the last two (supported by George Hepburn, M.D., of Lynn, an old friend of William Stukeley) performed the same office for James Brecknock, the apothecary at Holbeach who by now was a relation of Stukeley's by marriage. His friend had in February 1736 taken as his second wife William's cousin Margaret, daughter of Uncle Adlard Stukeley, widow of another Holbeach friend, Jacob Davey.[28] Others members of William's family also married apothecaries. When in London he had come to know Isaac Newton well, and was moved to note in his common place book, "Sir Isaac, born Christmas Day 1642, when a lad lodgd at my Cozens Mrs Clark next door north of the George Inn." [In Grantham] "My Coz Ralf Clark says it was his grandfather that Sir Isaac Lodgd withall when a schoolboy."[29] Coz Ralf (1685–1764) was a surgeon and apothecary in Grantham, the son of an apothecary, William, and the grandson of another, with whom the young Isaac had lived; Ralf had married Judith a cousin of Stukeley's.[30]

Life in a provincial town became increasingly irksome to Stukeley. When he had lived in Boston he had begun "to study matter out of my profesion – antiquity, genealogy, chronology, astronomy, mathematics", subjects which he explored to the full when he had lived in the capital. Now he found the "great want of literary conversation without which study is but trifling", much worse than he had anticipated. To some extent he overcame the problem by spending four of his Stamford winters in London, so when he had the offer of the rectory of St. George the Martyr, Queen's Square, London, he thankfully accepted it. He left Stamford in February 1748.

Thereafter his interests took him further and further into the antiquarian field. In the 1720s he had carried out the first objective and purposeful barrow digging record in which he made careful notes of the structure, but in later years he became a prey to speculation and fantasy.

At no point in his recollections does one gain the impression that William Stukeley felt himself to be the social superior of any of his apothecary friends and colleagues. William the physician and Adlard the apothecary were the sons of a learner–grazier turned lawyer, James Brecknock's father and grandfather were clergymen, as was the father of John Wilmer. On the other hand Brecknock's brother, William, was a grocer in Gedney, and his apprentice, Thomas Sturton's father was a currier at Sleaford, whilst William's cousin, Robert Stukeley, son of an attorney, was apprenticed to John Rix, shopkeeper, mercer and chandler of Holbeach, and good friend of the family. William's sister, Frances, married a collector of customs in the port of Boston, one of his daughters married a lawyer, another a parson. The two trustees of Brecknock's will were John Green of Spalding (M.D.Leyden,FRS,FSA) and his daughter's brother–in–law, George Palmer,a grazier.

Here we see little of the exactly adjusted social stratigraphy of the Victorian era. Families were close–knit in the eighteenth century, contact was maintained through the generations, cousins married first, second and third cousins and their friends' brothers, sisters and cousins. Participation in retail trade, as occurred in the occupation of the apothecary, did not condemn one to social ostracism. No one has put it better than T.S.Willan in his *An Eighteenth Century Shopkeeper. Abraham Dent of Kirkby Stephen,* when he suggested that "...it was the social snobbery of the Victorians that invented the tradesmen's entrance."

Notes and References.

1. T.W.Peck & K.Wilkinson, *William Withering of Birmingham*, Bristol, 1950, J.Wright, pp.31,33.
2. G.Clark, *The College of Physicians of London*, Oxford, 1964, Clarendon Press, 1:223. Gideon Delaune was the driving force behind the founding of the London Society of Apothecaries.
3. R.S.Roberts,"The personnel and practice of medicine in Tudor and Stuart England", *Med.Hist.* 1962, 6:376.
4. A.Rook, "Physicians, surgeons and apothecaries in Elizabethan and Stuart Cambridge", unpublished paper read before the Brit.Soc.for the Hist.of Pharmacy Conf.,1974.
5. G.Holmes, *Augustan England. Profession,state, and society,1680–1730,* London, 1982, Allen & Unwin, passim.
6. "The Tristrams of Belbroughton", in A *Belbroughton Miscellany,*A.Spier (ed.), 1985,No.1,; Public Record Office (Kew), Inland Revenue Apprenticeship records, I.R/1/42 and I.R./1/2; Guildhall Lib., Grocers' Co. Bindings, MS 11593/2.
7. In many families medical practitioners of all types may be found amongst their members. For example the Bromfields of London had two druggists, two surgeons (one of them the famous William Bromfield who could command premiums of over £700), two M.D.s (one of Padua and one of Oxford) and two apothecaries.
8. W.C.Lukis (ed.) the *Family Memoirs of William Stukeley,* 1882–1887, 3 volumes, Surtees Soc., 1:36.
9. James Ascough, apothecary and chyrugion, was buried at Holbeach on 15 February 1704. His daughter Jane was baptised nine days later. See Holbeach parish registers.

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10. William's place with his father was taken by his next brother, John, aged 13. Benet College is now Corpus Christi.
11. John Vigani when not at Cambridge lived at Newark-on-Trent where he married into a local family. From his descendants sprang a well-known dynasty of Nottingham pharmacists.
12. James Brecknock had probably been the apprentice of James Ascough in Holbeach and succeeded to his practice. He received a bishop's licence to practise surgery in the diocese of Lincoln on 30 August 1708. These licences were often given after a man had been practising for several years, and are more a recommendation to his probity than to his medical or surgical skill. He died 23 December 1746 and a wall memorial bearing his coat of arms is to be seen in Holbeach church.
13. P.R.O.,(Kew), I.R./1/43; Holbeach parish register shows that "Mr John Rix, shopkeeper", was buried there 28 May 1718.
14. He frequently went simpling with the future Rev. Stephen Hales, dubbed the "Father of Physiology".
15. Richard Mead was his proposer for the Royal Society.
16. Adlard was baptised at Holbeach on 11 May 1693. Samuel, son of John Arnall was bound apprentice to Robert Jessop, apothecary of Boston, in 1712. (See I.R./1/1.)
17. Lukis, op.cit., p.48. The licence was issued by the bishop of the Lincoln Diocese.
18. P.Cave,"Early eighteenth century Wisbech doctors. The Massey Brothers",in *Medicine in Wisbech and the Fens,* J. Arthur (ed.) Wisbech,1985, Seagull Enterprises.
19. R.Gough & J. Nichols,"The Gentlemen's Society at Spalding" in *Literary anecdotes of the 18th.Century,* London, 1812, J.Nichols, 6:1-162;list of members 69-122.
20. F.Celoria,"Eighteenth century fieldwork in London and Middlesex",*Trans.Lond. & Middx.Arch. Soc.*,1968,22:25.
21. Guildhall Lib., Apoth. Soc. Court Minutes, MS 8200/4, f.380, MS 8200/5,f.52r. "John Willmore the son of Cartwright Willmore of Elsborough, Bucks.,clerk,...bound to Henry Proctor" September 1712 for 8 years. Made Free December 1720.
22. Lukis, op.cit.,p.75.
23. Stukeley calls the village Barston but he should have written Barkston which is a few miles from Allington.
24. J. Whitaker, *History of Richmondshire,* 1823, 2:71.
25. Lukis, op.cit.,2:311. The *D.N.B.* however says that Wiseman died suddenly at Bath about 20 August 1676 and was buried at the upper end of the church of St. Paul's,Covent Garden on the 29th; this is borne out by the parish register of St. Paul's.
26. The title of "Alderman" in Grantham is equivalent to that of "Mayor" in other places.
27. Apoth. Soc. Minutes, MS 8200/7,f.90. On 15 Oct. 1754 John Truesdale was made Free by redemption. The living at Stamford to which Stukeley succeeded had been held by John Rogers'brother
28. Jacob and Margaret Davey's daughter, Sarah,became the wife of Brecknock's apprentice Thomas Sturton. Their son Jacob Sturton became private secretary to the Marquis of Rockingham.
29. Lukis, op.cit.,p.116. For a detailed discussion of the Clarks of Grantham, apothecaries in that town for five generations, see T.D.Whittet,"Lincolnshire apothecaries' tokens and their issuers" in *Lincs.History & Arch.* 1989,24:20-23.
30. T.S.Willan,*An Eighteenth century shopkeeper,* Manchester Univ. Press.,1970, p.146.

Acknowledgments.

I am grateful to Mr Ronald Drury of Lincoln whose knowledge of local history and genealogy in Lincolnshire has saved me from errors and has added so much flesh to the bare bones of this account. I would also like to thank Mr Laurence Sturton of Woking who has put at my disposal his fine work on the Sturton family of Lincolnshire.

The Gift of Thomas Basden , Apothecary in London. 1756.

One summer Mr Bernard Matterlaer of Kortrijk, Belgium, (Secretary of the International Academy for the History of Pharmacy) and his wife Renee were touring England when they came across the coat-of-arms illustrated here in the church at Cranbrook, Kent. They have asked us whether we know anything about this man. The answer is "Yes", but not a great deal!

He did an eight year apprenticeship with John Boddington, citizen and apothecary of London, and gained his Freedom of the Society of Apothecaries on 1 February 1731/32. Barret's *History of the Society of Apothecaries of London* (p.149) relates that in 1769, "As a new year's gift Mr Thomas Basden, one of the Assistants, presented the Company with the King's Arms, painted and gilt. These no longer exist." In 1773 he was elected Renter or Lower Warden, the following year Upper Warden, and for the year of 1775 to 1776 he was Master.

He appears to have practised all his life at Ratcliffe Cross (on the eastern edge of London) probably taking over Boddington's business as he was also of Ratcliffe. Only five months after he had gained his Freedom, he became the master of Robert, son of Samuel Nixon, for which he received £63 "consideration money".A man of some culture, he subscribed to at least two books, *The posthumous works of Jeremiah Seed* (1750) and *An Essay on the Government of Children* (1753) by James Nelson.

From his will, dated October 1778, we learn that he owned a freehold estate, Turks Place, at Hartley, Cranbrook, and premises in Milkhouse Street, Cranbrook. What we never learn is why he liked giving away Royal coats-of-arms!

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Contents

Diary Dates.

Thursday, 23 September 1993.
The British Pharmaceutical Conference, Reading.
History of Pharmacy Session.

Dr Norman Heatley will be talking about the early days of Penicillin.

Society Members' Activities.

Dr W.E.Court has delivered a lecture at the Institute für Pharmazie, Johannes-Gutenberg University, Mainz, the title of which was, "The Standardisation of Natural Products - an historical survey." He was able to spend an afternoon in the Johannes Gutenberg Museum of which he writes, "It includes some excellent examples of early herbals including copies of the Krateus with illustrations and early copies of first printings of Galen and Dioscorides. Perhaps even more remarkable, they were selling for 38 DM. prints of Elizabeth Blackwell's botanical paintings that were originally painted in the Chelsea Physic Garden when Hans Sloane was encouraging botanical illustration by Blackwell and Ehret in order to help the apothecaries and their apprentices to recognise and therefore standardise their drugs. I was fascinated as Sloane and Blackwell were in my lecture script for the following afternoon."

The American Institute of the History of Pharmacy is to award their Edward Kremers Award to Professor Clifford M. Foust of the University of Maryland for his *Rhubarb: The wondrous drug.* (Princeton University Press, 1992. 371 pp) The book considers rhubarb from antiquity to the present from the viewpoints of international trade, scientific and economic botany, adulteration, and medical and culinary use.

Dr Gregory Higby, director of the American Institute has been commissioned to research and write the early history of the United States Pharmacopoeia

Owing to pressure of work Dr J. Burnby has resigned from the Executive Committee of the Faculty of the History and Philosophy of Medicine and Pharmacy of the Society of Apothecaries of London. Her place has been taken by Mrs Enid Lucas-Smith, treasurer of BSHP. Mrs Lucas-Smith's appointment is particularly appropriate as she has very recently been admitted to the Freedom of the Apothecaries' Society; she is only the second woman pharmacist to be so elected.

Members will be sorry to learn of the death of Mrs Maudie Jervis who contributed a short article to the *Historian* (March 1922) on her introduction to pharmacy and the work of her father Samuel Bratley. We hope that we will continue to see her son Alan at our Spring Conferences; although not a pharmacist he has always shown a keen interest in pharmacy's history.

Last November Mr Leslie Matthews attended the Congresso Nazionale di Storia della Farmacia which was

1848

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held in Rome. He has sent us a short report of the proceedings which in particular celebrated the centenary of the first Italian pharmacopoeia. Though many Italian cities during the past centuries had their own separate formularies and pharmacopoeias notably the well-known *Receptario Florentino* of 1498, no official pharmacopoeia applicable to the whole country was authorised until 1892. It is in a format of 10 x 6 cms. and has on its title page the words "Ministero dell Inferno" printed, followed by "Direzione Santa Publica" and below that "Farmacopoea Ufficiale Del Regno D'Italia". At the time the pharmacopoeia was introduced a two page injunction was issued directing the attention of the medical and pharmaceutical professions to its use, particularly that pharmacists must possess a copy and that it must be available and constantly employed.

GODFREY'S CORDIAL AGAIN.

Wootton in his *Chronicles of Pharmacy* (Vol.2, p.177) wrote that an advertisement from *Reed's Weekly Journal* of 22 February 1722 threw light on the then still popular "Godfrey":

"To all retailers and others. The general cordial formerly sold by Mr Thomas Godfrey of Hunsdon in Hertfordshire, deceased is now prepared according to a receipt written by his own hand, and by him given to my wife, his relation, is now sold by me Thomas Humphreys of Ware, Surgeon, or at John Humphreys at the Head and Sheers in Jewin Street, near Cripplegate, London.

The *Chemist and Druggist* (25 June 1927) points out that Humphreys advertisement had appeared two months after the following had appeared in the Weekly Journal of 23 December 1721.

"This is to certify all Persons, that John Fisher, Physician and Chymist of Cheshunt, Hertfordshire, who formerly lived with Dr Godfrey of Honsdon, doth truly prepare his general Cordial" and urges buyers "not to meddle with the said Cordial prepared by illiterate and ignorant Persons, as bakers, malsters and Goldsmiths etc."

Both John Fisher and Thomas Humphries possessed bishop's licences to practise as doctors ("medicus"), the former in 1719 and the latter in 1715. Thomas Godfrey when sponsoring John Girvan for his licence in 1708 stated that he had an M.D. but did not give the university.(Bloom and James, London Medical Licences, 1529-1725. p.51)

Dr Selby Whittingham, an authority on the life and works of J.M.W.Turner, has shown however that the recipe had remained within the family. On 17 May 1788 Edward William Windus, aged 22, was married to Mary, daughter and heiress of Benjamin Godfrey, and he retired from active participation in his father's coach-building business. Edward and Mary's son, Benjamin Godfrey Windus was born in January 1790 in Sun Street, Bishopsgate, London. Not long after the family moved to a house in Tottenham on the east side of the Green then a much favoured middle class district and home to such famous pharmacists as the Corbyns and the Howards.

After boarding school in Hackney and attending a school for merchants in Tower Street in the City, young Benjamin was taken into his grandfather's proprietary medicine business. When old Benjamin Godfrey died in 1812 at Tottenham Green, aged 70, he left to his grandson the receipt for "Godfrey's Cordial" and the property of 61,Bishopsgate. (P.R.O., PCC.,Prob.11 1532. His mother had been bequeathed £20,000 in 3% Consols)

By 1819, the year in which both his mother and grandmother Godfrey die, he was rich and so able to indulge his great interest of collecting paintings, eventually becoming renowned for his collection of Turners. His father Edward William Windus died in 1832 whereupon he received the bequests in reversion which his other grandfather, Arthur Windus, "a coachmaker of great eminence in Bishopsgate-street" (*Gentleman's Magazine*, 1818, p.382) had bequeathed to him.

It would seem to be at this point that Benjamin Godfrey Windus severed his connections with the patent medicine warehouse by selling it to A.Willoughby. Family tradition always states that he had a great distaste for the "Godfrey's" connection, and was more usually known as a retired coachmaker, although in fact that business seems to have been run by his uncle Thomas Windus. For further details of Benjamin Godfrey's life, see S. Whittingham, "Windus, Turner and Ruskin" in *J.M.W.Turner, R.A.* No.2, 23 April 1990.

Notwithstanding their not inconsiderable wealth, the Windus family played their part in the community. Edward William became a trustee of the Reynardson's Almshouses in Tottenham in 1817, and from 1827 until his death in 1832 was a careful and responsible treasurer. On his death he was followed as a trustee by Benjamin Godfrey, and on his resignation in 1854, his son Benjamin Godfrey II was elected trustee. (See. H.G.Hawkes, *The Reynardsons and their Almshouses,* E.H.H.S., Occ. Paper No.40)

It is probable that by the time Benjamin Windus relinquished his interest in "Godfrey's" it was by no means the profitable business that it had been because by then the formula was well known. Paris's *Pharmacologia* of 1833 has the following recipe which he claimed he had had from a "wholesale druggist who makes and sells many hundred dozens a year.":

"Infuse 9ozs. of Sassafras, 1 oz. each of Caraway, Coriander and Anise Seeds in six pints of water. Simmer down to 4 pints. When cold add 3ozs. of Tinct. Opii."

J.Burnby.

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COOKWORTHY - CHEMIST AND POTTER.

A.G.M.Madge.

William Cookworthy was born at Kingsbridge, some twenty miles from Plymouth, in 1705, the son of a weaver and Quaker who died as William was entering his 'teens. Family tradition says that the widow and her seven children were impoverished by the collapse of the South Sea Bubble. Silvanus Bevan, the well known apothecary of Plough Court, London, possibly travelling on business in the south west of England, came to know of the family's plight and offered to give the fifteen year old boy instruction in the drug trade. No formal apprenticeship documents were signed.

In order to save money William walked the 200 miles to the capital carrying his few possessions in a kerchief. We have no knowledge how long the journey took or where he stayed en route, but probably it was Quaker families. During his six years with Bevan, William worked hard to acquire skills in his future career, became an insatiable reader of the classics, and taught himself French. A happy relationship grew up between master and apprentice to the point that in 1726 he returned to Devonshire to manage the firm of 'Bevan and Cookworthy', which was established in Notte Street.[1] Like that of the Bevans, it was both a retail and wholesale firm in its early days, the division of the business not occurring until the end of the eighteenth century.

In 1745 he wrote to his fellow Quaker Richard Hingston, apothecary and surgeon of Penryn, Cornwall, that he now intended to commit to writing "what I know in chemistry". This invaluable manuscript has been preserved and from it we can learn of some 180 pharmaceutical (not chemical in the more modern sense) formulae of his own manufacture, preparations such as Paeony Water and Ung. Nicotian. Cookworthy supplied drugs to many of the apothecaries and surgeons throughout the counties of Devon, Cornwall and Somerset, men such as John Mudge of Plymouth and John Wolcot in Truro, and to the celebrated Dr John Huxham, FRS.[2]

Cookworthy also had a good trade supplying drugs to the Royal Navy. In 1755 he obtained a contract for supplying medicines to the hospital ship "Rupert" which led to the Apothecaries' Society of London lodging a complaint with the Commissioners for the Sick and Wounded Seaman, reminding them that Society had been given the monopoly in the days of Queen Ann.[3] A protest was sent by the Master and Wardens to the Lords of the Admiralty but it would seem to have been to no avail as by 1778 Cookworthy was supplying the Commissioners with drugs and medicines to the tune of £700 a year. The Society of Apothecaries was probably not interested in supplying Mrs Dubois'"portable soup" made from the offal of oxen and said to resemble glue but Mr Cookworthy was awarded the contract for its manufacture in Plymouth and Portsmouth.

William Cookworthy also had a keen interest in mineralogy. He seemed to have that mysterious ability of being able to divine for metalliferous ores by means of a rod, and was a fine asssayer. At the beginning of the eighteenth century, only Böttger of Meissen had solved the problem of making Chinese or hard paste porcelain. Soon the secret was known at Sevres but in England, although the fine "china" of Bow, Derby, Chelsea and Worcester was much esteemed, it was of the soft-paste type and so lacked transparency.

Père D'Entrecolles, a French Jesuit, in two of his letters sent from China a detailed description of Chinese porcelain manufacture, which were published in 1736. Réamur,the famous French chemist, carried out a series of experiments using the Kaolin or China Clay and the Petunste or China Stone which had been sent to France, and published the results in the "Transactions de l'Academie des Sciences" which Cookworthy read in the original French, so becoming interested in the problem.

Cookworthy travelled widely in connection with his druggists business and it was in about 1745 that he discovered the essential ingredients in Cornwall.

The problems of true porcelain manufacture were however by no means over. Cookworthy for twenty years carried out experiments on the proportions to be used, the critical temperature, the best fuel and so on. The earliest work would have been done in his own laboratory but later he must have had to resort to a working pottery. Which one he used we do not know but it has been suggested it was in Bristol, a noted pottery making centre. By 1768 he was ready to go ahead and took out a patent on 17 March.

The pottery was situated at Coxside on the far side of Sutton Pool from Cookworthy's Notte Street druggists business, conveniently near to the quayside where the Kaolin and Petunste were landed. Plymouth China, as it came to be called, rapidly became popular but economically it was not a success, probably because of the large percentage of wasters and the high cost of the fuel necessary to reach the vitrification temperature. After two years the manufactory was moved from Plymouth to Bristol. Bristol was a larger town with many rich merchants who could be induced to invest in the new venture, a wealthier hinter land, and a pool of experienced potters from which to draw.

Sad to relate the pottery proved just as difficult to run in Bristol, and in 1773, Cookworthy now in his late sixties, decided to sell his interest in the factory and the patent to Richard Champion his partner. The final transfer occurred in May 1774.

Cookworthy had always been an active Quaker but in 1762 became interested in the works of Emanuel Swedenborg which he translated from Latin into English. Swedenborg,(1688-1772),a Swedish mathematician, physiologist, inventor and professional engineer developed a highly individual religious doctrine. He was a tolerant

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man with a great belief in the powers of love and the complete survival of personality after death, ideas which Cookworthy found comforting after the loss of his wife.

The mid-eighteenth century in Plymouth and district was a period of some brilliance. The painters John Opie, James Northcote and Sir Joshua Reynolds were local men, the brothers John and Thomas Mudge, the one an apothecary, surgeon and inventor, the other an astronomer, mathematician and instrument-maker, and both Fellows of the Royal Society, Edward Spry, medical practitioner and experimenter, and the famous Dr John Huxham, FRS,with their eminent visitors such as Samuel Johnson and Sir Joseph Banks, and those who came to work as did John Smeaton FRS, gave an atmosphere in which William Cookworthy flourished and made his own valuable contribution.[4]

Notes and References.

1. It would seem that William Cookworthy left Silvanus Bevan just about the time the latter's brother Timothy, having been "bred an apothecary in the country" joined him at Plough Court. The Bevans withdrew from the Plymouth firm in 1746 when Philip Cookworthy, William's brother, became a partner.
2. John Mudge was trained as a surgeon and apothecary in Plymouth and certainly practised as one until he was in his forties. He did not obtain an M.D. of King's College, Aberdeen until 1784 when he was 63.; John Wolcot, later known as the witty satirist "Peter Pindar", also a native of Kingsbridge, was trained as an apothecary and surgeon by his uncle of the same name at Fowey, Cornwall. He obtained further medical training in London and in 1767 was sponsored by the aged Dr Huxham for one of the convenient Aberdeen degrees. After a short period in Jamaica, he practised as a physician in Truro until 1780 when he moved to London.
3. E.A.Underwood, *History of the Society of Apothecaries of London,* Oxford, Wellcome, 1963, p.158 ; A.D.Selleck, *Cookworthy (1705-1780) and his circle,*Plymouth, Baron Jay,1978, p.36.
4. Edward Spry was apprenticed to George Woolcombe, surgeon and apothecary, for five years from 1 July 1742. Later he obtained two M.D.s, one from Aberdeen in 1759 when he was 31, and the other from Leyden in 1768.

THE HISTORY OF A.H.COX & CO. LTD.

C.Fearon.

The company of Arthur Hawker Cox can be dated back to 14 June 1839 when, aged 26, he opened a chemist & druggist's business in Ship Street, Brighton. He was the son of Edward Cox, a cabinet maker in the Haymarket, London, and his wife Sarah Homersham. We know little about the Coxs except that Edward hailed from Northamptonshire and that one of Arthur's brothers, Edward Homersham, became a barrister which argues that the family was not without money. The name of Arthur's apprentice master is unknown but he was probably a druggist in Brighton as a still extant recipe and notebook of Arthur's has the date 1828 on it and was purchased in Brighton.

This notebook gives an excellant idea of the wide range of products not only sold by druggists in those days but also made by them. There are recipes for the usual cordials, cough linctuses and brisk purgatives, but also for curry powder, blue, green, black and red ink, hair scent and of course veterinary medicines. However, Arthur Cox's particular claim to fame and the basis of his future success was his development of a tasteless pearl coating for pills.He claimed that the pills might "be kept in the mouth for several minutes without taste though soluble in a short time even in cold water." He experimented for many years before he finally decided to patent his invention in 1854.

He was also of a political cast of mind and spent much time and effort working for the Anti-Corn Law League, to the point that he called his second son Richard Cobden Cox. He helped in the fight for Brighton's battle for incorporation, and when this proved successful was an alderman from 1859 to 1901, during which time he was adherent of the Liberal Party.

Arthur Cox's first wife was Mary Anne Strudwick who bore him five children before her death. His second marriage to Elizabeth Frances Claxton resulted in seven more children. These two families, separated by many years, led to his decision to divide his wholesale and retail business into two parts. The Ship Street shop he handed over to his eldest son Homersham Edward in 1871, and the manufacturing side he retained for himself, moving to new premises in St. Martin's Place.

The earliest catalogue to survive is that of 1875 which lists 331 products, 58 of which conformed to British Pharmacopoeial standard. By this time laborious pill making by hand, except for "specials" had been superceded by rotary pill machines. The 1890 catalogue showed an ever expanding range of pills with about 700 varieties; six years later there were 800 formulations. The everyday running of the works was by now in the hands of two of Arthur Cox's sons by his second marriage. Arthur Hawker II (1873-1927) started in the works in the late 1880s, and Edward Edwards Cox (1877-1950) in the 90s. Family tradition says that they wished to move into the field of tablet-making but fearing that autocratic father would totally reject the idea they secretly imported a machine and a German operator. The secret, as secrets always are, was discovered but to their surprise their father accepted the new practice willingly.

A Private Company.

In 1896 now aged 83, Arthur Cox made his will although he was to live for another seven years. He instructed his trustees to convert the business into a private company and were to supervise the administration of the firm until his two sons Arthur the younger and Edward took over. These sons were to receive a quarter of a the profits each, and the remaining half was to be divided amongst the children of the second marriage.

Incorporation took place immediately after old Arthur Cox's death in 1903, no shares were issued to the public and the firm remained a purely family one. The two

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brothers however were intent on expansion, the firm having earned only about £2,000 profit before tax (which was negligible in those days) in 1902.

The first step seems to have been to enter the proprietary medicine trade in a small way in 1906 which they bought from Henry Barton's estate. Then three years later they acquired the patents for "massolettes" which were soured milk products. These proved immensely popular, so much so that a subsidiary company was formed, Lactic Ferments Ltd., to take over the business and was run from premises in Brunswick Row. Unfortunately this latest fad died as quickly as it had arisen and the new company went into liquidation late in 1911. This venture however had led Cox's into the toiletries field which for a period was successfully developed.

The mainstay of the company however was to remain pills and tablets which were steadily expanding, so much so that the premises at St Martin's Place were proving hopelessly inadequate. First of all the tabletting department was moved out to a building in Lewes Road, but the problem was not really solved so in 1910 it was decided that radical steps must be taken. Late in 1910 it was agreed that they should buy the Brighton and Sussex Laundry also in Lewes road, and the move took place in 1911. Although the firm's profits were rising satisfactorily, there was a shortage of working capital, and so a loan had to be obtained. The move and expansion was nevertheless a success resulting in almost doubling the net profit by the outbreak of the 1914-1918 war.

Women at work.

Cox's could not be regarded as a strongly innovative firm, but in one respect it was certainly before its time. In February 1909 the company secretary, William Prior, was taken ill whereupon Edward Cox's sister-in-law, Lettice Baskerville Mackie, was appointed to act in his absence. On his death in May, the appointment was made permanent. Members of the family, as was the case in many family concerns, had the habit of treating the firm's loose cash as just an extension of their own, a habit which Miss Mackie firmly clamped down on. Altogether she was a most highly woman which was recognised by the directors. In 1930 she joined the Board and four years later was made Assistant Managing Director.

Neither Arthur nor Edward Cox was conscripted to the forces when conscription was introduced in 1916 (Arthur was over-age anyway) but of course there was a loss of personnel many women had to be brought in to replace them, particularly as sales were rapidly increasing. Although Government contracts were not so profitable as ordinary sales, and there was also an excess profits tax, by 1918 the net profit had more than doubled. Nevertheless in order to bring about this rapid increase in production bank loans had had to be obtained.

The post-war boom lasted for about two years and then abruptly collapsed. Happily Cox's directors were conservative men and there were enough reserves to save them from financial disaster. In 1921 the next generation of Coxs was brought into the firm in the persons of Arthur's eldest son,Tom,and Edward's eldest son, Valentine. Tragically Tom was killed in a motor bike accident the following year, and Valentine never showed much interest in the business, but at least he left to posterity an amusing collection of verse and line drawings of Cox's staff. Valentine left in 1930 but by that time two other members of the third generation had joined the firm, Arthur's son Roy and Edward's son Anthony.

Bile Beans to the rescue.

On behalf of the Chemists' Supply Association, Cox & Co. opposed Fulford's of Leeds attempt to register the trade mark, Bile Beans, but in the end an entirely different arrangement was made. In return for Cox's withdrawing their objections, Fulford's suggested that they would arrange for Cox & Co to manufacture all future supplies of the pills which previously had been made in America. The contracts were large, 64 million pills being the agreed figure in June 1931, and undoubtedly they saved Cox's during the difficult inter-war years.

Relationships between Fulfords and Coxs remained good and were further improved in 1938 by J.H.Fulford becoming a director of A.H.Cox & Co. In 1939 the business was a century old and to mark the occasion a notable dinner was given at the Old Ship Hotel in Brighton, but once more war was about to intrude on the running of the company.

Anthony Cox and Roy Cox and a high proportion of the younger men all joined up, so that once more the burden of running the company fell on Edward Cox now well into his sixties, and his sister-in-law, the redoubtable Lettice Mackie. As before there were large Government contracts to fill and vacant posts were taken up by women. The factory lay in a highly vulnerable part of Britain but no direct hits were scored, so that its position after the war was less difficult than some. It was however subject to all the severe shortages of material, fuel and new equipment felt through out the country.

The Bile Beans contracts with Fulfords were continued but the sale of these pills began to diminish after 1949. Their place was now taken by Coxs making Sulphamezathine, Sulphanilamide and Paludrine tablets for I.C.I. The factory also moved into pastille making which proved a successful venture.

In the 1950s they ventured into a new range of products termed Chemists Own Brand in which Coxs packaged tablets, mixtures, creams and ointments into containers which were then labelled with the retail pharmacist's own name, address and brand mark which was designed by

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Cox's graphic artist. The idea was a good one and proved to be very popular with some 2,000 chemists but was so labour intensive that it did not add much to Cox's profits.

Indeed profits were very fluctuating during the 1950s and 1960s. There were far too many different lines, many of them with short, uneconomic runs, and the factory itself was a nightmare of improvised, over-crowded buildings on no less than six different levels. In 1963 Continental Laboratories became a subsidiary of the firm and in the following year a new product, Co-Tabs, was launched. The idea, that of the Technical Director Hubert Cleary, was in advance of its time and proved an expensive failure. It was an attempt to stamp all tablets with a code whereby they could be easily identified by pharmacist or doctor. The period was the hey day of branded tablets and before generics were accepted so that the venture was doomed to fail.

In 1971 there was a merger with the business of Thomas Marns whose factory was at Rustington. Since 1965 Marns had been manufacturing Dr Mackenzie's Medicated Smelling Salts, and had so boosted their sale that they now accounted for a quarter of his business. This proved good business for Coxs and one that is still in being.

From Brighton to Barnstaple.

The Medicines Act of 1968 demanded that all pharmaceutical companies had in future to have a manufacturing licence and a product licence for each product sold, which meant that the factory was now subjected to inspection of its premises, procedures and quality control. Cox were granted the manufacturing licence in 1973 but the inspectors were far from happy about the somewhat ramshackle factory buildings. In 1976 they gave an ultimatum - complete refurbishment or new modern premises or else the licence would be withdrawn.

Little consideration was needed to decide that a move was the only option and a search for new premises began. Property prices in the South-East proving exhorbitant, the decision was made that the company should be moved to an area where development grants would be given towards the financing of a new, purpose-built factory. Finally,the site at Barnstaple was chosen in 1976 and the move was made in a series of steps during 1979. The intimate link with the Cox family was by now almost severed. Nicolas Cox, son of Anthony, who had joined the firm in 1956 when he was 24, and had become Chairman and Managing Director in 1974 now handed over the Managing Directorship although retaining his position as Chairman until January 1985.

It proved to have been a wise move because by 1984 sales were nearly double those of the closing years at Brighton. Generics could be described as Cox's speciality and now was the period it was to come into its own. The patents of many branded but highly priced pharmaceuticals had either run out or were about to do so in the near future so that generic manufacturers were encouraged and were being actively encouraged to expand. Cox's were no exception.

In December 1984 it was announced that A.H. Cox & Co. was to be sold to Hoechst U.K., the British subsidiary of the German giant of Hoechst; complete autonomy was agreed. The increase in available finance has proved very advantageous, extensions to the laboratories have been made as they have to other parts of the factory with resulting much increased production.

One can not but wonder what old Arthur Hawker Cox I would think if he could return today and view the buildings and equipment which are the descendents of his little shop in Ship Street, Brighton.

Book Reviews.

A Plain Treatise on the Peruvian Bark (The Stanitz MS.) by Saul Jarcho M.D.
Boston, USA, 1992, F.A. Countway Lib.of Medicine, pp.vii+116,
ISBN 0-88135-176-8. Price $ 19.95.

This presentation of an anonymous manuscript written in the late seventeenth or early eighteenth century is arranged with the original Latin text on one page and an annotated translation on the facing page. The author-translator deduces that the early author was a well-read physician who had practical experience of therapy with Jesuits' Bark, did not favour philosophical speculation in medicine, and was probably Italian. The script discusses the early history, pharmacology and therapeutics of cinchona bark. The current state of knowledge is revealed by the observation that, "There is no lack of persons who believe that Peruvian Bark melts and dissolves the blood, with the result that noxious ferments are disengaged and dissipated in it."

Nevertheless the writer opposed venesection as it only weakened the body and the patient's fever recurred more violently, also he did not favour catharsis before treatment although permitting emesis. The chapter on treatment refers to draught, pill, bolus, tincture and infusion as suitable drug forms and an equivalent dose of one drachm of powdered bark. The great interest of this book is its demonstration of the change from the old Galenic ideas to a new philosophy based on experimentation, although the true cause of malarial fevers would not be understood for another two hundred years. W.E.Court.

Readers may care to note the following books have been published

J. Surtees, *Barracks, Workhouse and Hospital, St. Mary's, Eastbourne,* 1794-1990. Eastbourne Local History Soc.,pp.160, 59 illustrations, £5.25 + £1 p. & p.

J.Andrews & I.Smith, (ed.) *"Let there be Light Again": A history of Gartnavel Royal History from its beginnings to the present day.* Glasgow, 1992, Gartnavel Royal Hospital, pp.130, £5.00. ISBN 0-9520742-0-6.

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THE EDINBURGH DISTRICT CHEMISTS' TRADE ASSOCIATION: A CENTENARY REVIEW.

A.W.Patterson.

The Edinburgh District Chemists' Trade Association was established in December 1892 and an extant Minute Book extending until 1909 reflects the concerns and problems of chemists & druggists in the late Victorian and Edwardian period. The legal and commercial problems of the Edinburgh Association would undoubtedly be duplicated in the concerns of many local Chemists' Associations throughout Britain during this period.

The background to these problems derived from three considerations:

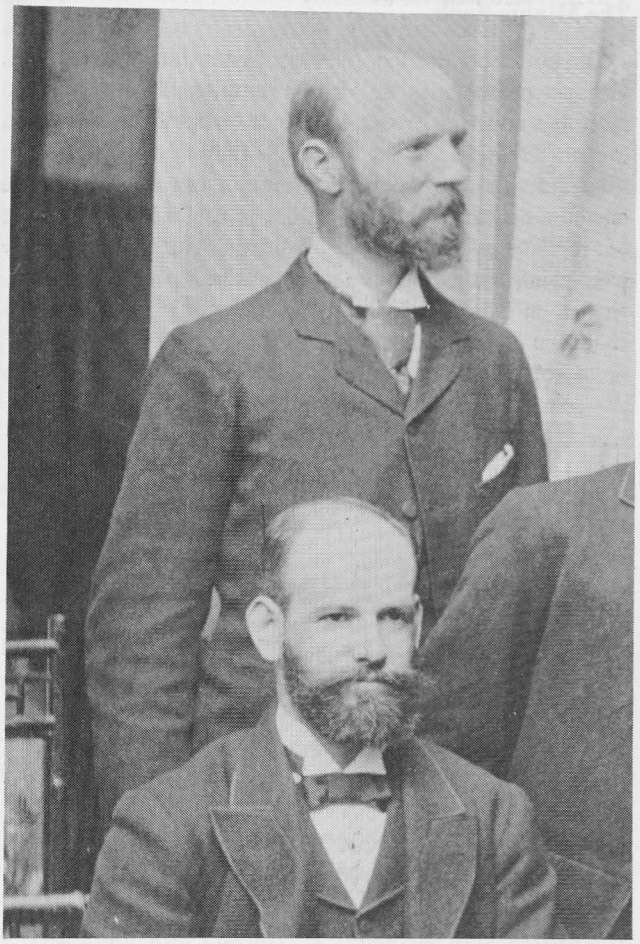
1. The Pharmaceutical Society of Great Britain, responsible for the legal registers of chemists & druggists and pharmaceutical chemists, was endeavouring to evolve into a truly professional body as distinct from a mere commercial trade organisation.
2. In the fiercely competitive market economy of the period the generally accepted philosophy was that of free trade, anti-monopoly and laissez-faire.
3. Neither the Government's view on control of poisons, nor the Inland Revenue's view on liability to Medicine Stamp Duty, coincided with those of the Pharmaceutical Society and of the chemists & druggists.

The dichotomy between professional and commercial pharmacy meant that the Pharmaceutical Society felt obliged to pursue the professional aspects and was thereby inhibited from pursuing the commercial interests of the retail chemists & druggists. The latter were thus forced to form local Trade Associations to defend their commercial interests, as early as 1839 in Aberdeen. This trend increased, especially from the 1870s, until in 1895 a Federation of Local Pharmaceutical Associations came into being.

This division of interests was exacerbated by the fact that membership of the Pharmaceutical Society, following registration, was voluntary at this time so that relations between the Society and the non-member rank and file chemists & druggists were often somewhat strained. As it happened however, several of the leading members of the new Edinburgh Association were members of the Pharmaceutical Society so that the Association enjoyed the benefit of meeting in the Society's house at 36, York Place. Also, Mr J.Rutherford Hill, the Society's Resident Secretary in Scotland was made the first honorary member of the Association which made for useful liaison over the years.

Inauguration and Administration of the Edinburgh Association.

The inaugural meeting held on 8 December 1892 was a "a meeting of Chemists in business in Edinburgh, Leith and District", was convened by Mr Peter Boa, Ph.C. and proprietor of a pharmacy in fashionable George Street, Edinburgh. He said "that it was the outcome of a long expressed desire for something of the kind being inaugurated in Edinburgh."



Edinburgh notables. J.Rutherford Hill, seated, was Resident Secretary in Scotland of the Pharmaceutical Society from 1886 to 1936. Peter Boa, standing behind, was the driving force behind the establishment of the Edinburgh Chemists' trade Association. he was a member of the Scottish Board of Examiners and contributed some fifty papers on pharmacy to the Journal or scientific meetings.

The usual office bearers and a committee of twelve were appointed and charged with drawing up a constitution and rules, which they did and had a galley proof printed. After slight modification the rules were printed on a folded membership card. The chairman was to serve for two years and was to be succeeded by the vice-chairman, and so on.

The objectives of the Association were stated to be "to hold meetings for the discussion of matters affecting trade interests, to obtain removal or modification of improper or unnecessary restrictions imposed upon Chemists, and to maintain their rights in the exercise of their busines according to law." Membership in the first six months

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reached 3 with a peak of 94 ordinary and 4 honorary members in 1907. This, nevertheless, was only about half of those eligible for membership in Edinburgh and district, despite repeated efforts at recruiting more members.

The Minute Book.

The book contains the minutes of 64 ordinary and annual business meetings as well as the minutes of 81 committee meetings, covering seventeen sessions from December 1892 to June 1909. Evening meetings began at 9 p.m., so illustrating the long shop hours then in vogue. Sometimes business had to be adjourned to a future meeting because of "the lateness of the hour". Notices of general meetings were printed and posted to the membership. The minutes, written in stately Victorian prose, record that thanks to chairmen or speakers were invariably "cordial" or "hearty" or "accorded with acclamation". Scottish expressions also

appear, adding colour to the reports, such as "anent" meaning "regarding", or "thereanent", that is "concerning that matter".

The membership subscription started at five shillings per annum but within a year was reduced to 2s.6d., and appears to have remained so.[1] The financial balance at the first Annual Business Meeting in 1893 was less than £3, augmented by £9 from the residual funds of the former Chemists & Druggists' Association of Edinburgh which regarded the new body as its successor. A further influx of funds from social activities brought the balance to over £56 by 1897, the year of Queen Victoria's Diamond Jubilee. For this year the Pharmaceutical Society's usual annual subscriptions to the Benevolent and Orphan Funds of two guineas and one guinea respectively were increased to five and two guineas.

Problem solving.

At its first ordinary meeting the Association had "instituted a book" which contained "the names of persons to whom it would be inadvisable to give credit". Most of the leading members of the Association had their businesses in the stylish New Town in Edinburgh which was then almost entirely residential, and it is probable than some of the residents, having difficulty in keeping up appearances, ran into debt.

An intriguing item was the scheme for the disposal of "out of the way" articles. An up-to-date list of these was kept by the secretary and printed on the "billet" of each ordinary meeting. If such an article was disposed of and the secretary not informed, a fine of sixpence was imposed

which was not unreasonable considering the inconvenience and cost of tram fares for a message boy sent to another pharmacy for something no longer on the list.

On the topic of tramways and message boys a problem arose in 1905 when the tramway company withdrew concessionary "message boy tickets". The Association, however, managed to arrange a discount of 7½% on the bulk purchase of £10 worth of tramway tokens. Over the following two years £70 of tokens were bought by the membership through the Association which purchased the tokens in batches.

Concern for fellow chemists is illustrated by the "Fraserburgh Case". A chemist in the North had been slandered by a local doctor. The chemist took the matter to court but lost. Chemists in Scotland then subscribed to an appeal fund, the Edinburgh Association sending five guineas. On appeal the chemist won his case, and the Minutes record the congratulations sent to their colleague.

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Apprentices and Assistants.

Socially the Association arranged an annual full day excursion in June and undertook the organisation of a ball in the winter for a number of years, later sharing that responsibility with the Edinburgh Chemists' Assistants' and Apprentices' Association and the Athletic Club. How time for these desirable activities was carved out of the over-long shop hours is a mystery.

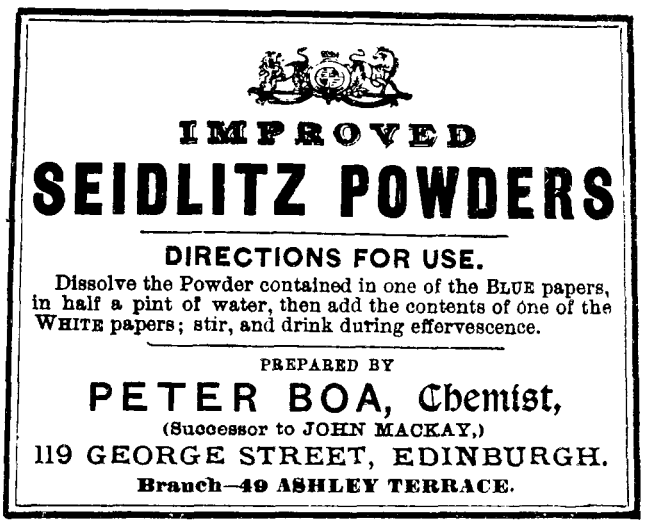
In 1898 the Association established a prize scheme for apprentices and assistants, the topics of examination being "commercial or legal questions bearing on pharmacy". The answer papers were submitted anonymously under a motto. "Humanum est errare" won the first prize of two guineas with 86% of the marks, and the second prize of one guinea with 80% of the marks went to "Is the labourer worthy of his hire?" This was an encouraging start for the introduction of the scheme. After a due interval the answer papers were to be cremated but with what ritual or ceremony it is not vouchsafed to us to know.

"The Apprentice Difficulty" was the title of the chairman's addresss in December 1901. At the turn of the century there was a general shortage of chemists' apprentices. Subsequent to the Pharmacy Acts' Amendment Act of 1898, the Pharmaceutical Society's Preliminary Examination was discontinued and the standard of preliminary or general education for entrance to pharmacy was raised. This was considered to be the root of the problem. Youngsters with the required qualifications appeared to be gravitating towards occupations offering better remuneration, more congenial working conditions and shorter hours. in retail pharmacy, at this time, shop hours were normally 8 a.m. to 9 p.m. six days a week plus attendance at three separate times on a Sunday. An Act of 1892 had restricted shop hours for an employee to 72 hours a week, so to accommodate this, apart from meal times, apprentices in Edinburgh were given a half day "holiday once a week or fortnight. The apprentices, however, complained that often this "half holiday has to be given up for the time required off for classes" and that this caused "a weariness to the flesh".

Medicine Stamp Duty and the saga of the apostrophe.

Few people entering pharmacy much after 1941 will have any familiarity with Medicine Stamp Duty, although it had been the bane of our predecessors.

At the first ordinary meeting of the Association, apart from organisational matters, one of the only two items of business concerned the Medicine Stamp Duty. This duty was an important source of revenue to the Exchequer of the day. Medicine Stamp Acts were on the statute book from 1783 to 1941, the Act of 1812 causing the problems to the late Victorian chemists & druggists. The criterion for imposition of the duty was that the article vended was recommended as a medicine and also that its formula was secret, thus covering the notorious patent or proprietary



nostrums then in vogue. The Act did, however, provide for chemists & druggists to sell, unstamped, non-secret remedies the formula of which was "known, admitted and approved" and available in well known works of reference. In theory, an odd exception to this exemption was a medicine labelled in the possessive case such as the long established Anderson's Scots Pills The problem was that the Board of Inland Revenue had now decided to re-interpret the provisions of the 1812 Act to the benefit of the Exchequer and insisted that the apostrophe automatically involved liability to Stamp Duty even though the formula was well known and no secret.

The Edinburgh chemists & druggists were particularly hardly hit because the prescriptions of a number of famous physicians of the recent past had become well known to the public, both locally and further afield, and were in great demand, for example Gregory's Pills, Hamilton's Pills, Christison's Pills etc.[2] These pills were often sold in pennyworths in very small boxes with very small labels, so severely limiting the detail which could be printed on them and making it impossible to implement some of the Inland Revenue's later suggestions.

The Council of the Pharmaceutical Society having declined to approach the Inland Revenue on behalf of the chemists & druggists, the committee of the Edinburgh Association decided to organise a petition to the Board of the Inland Revenue in collaboration with the other Scottish Chemists' Trade Associations. The "Memorial" as it was called, dated 21 June 1894, was duly submitted to the Board. The Inland Revenue made some impractical suggestions but otherwise remained intransigent in the matter of the apostrophe or possessive case. It was not until 1903, as a

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consequence of the test case "Farmer v. Glyn-Jones" that it was obliged to abandon it stance in regard to the apostrophe.

In the meantime, in 1895, another complication pertaining to stamped medicines had arisen. Doctor's had taken to writing prescriptions which called for small quantities of these medicines so that the dispensing of them involved breaking bulk, and to be within the law, a medicine stamp had then to be put on the dispensed medicine. In an attempt to alleviate this problem, in March 1895, the Association sent a letter of explanation to all the doctors in the district, at the same time suggesting that the difficulty could be overcome by adding to the prescription an inert diluent such as syrup. For example, a prescription for two fluid ounces of Fellow's Syr. Hypophosph. Co. required a medicine stamp, but if,say, two and half ounces were diluted with half an ounce of Syr. Aurant., then Fellow's Syrup became an ingredient of a medicine and so exempt from the stamp duty. Five hundred and fifty of these circulars were sent out and were said to be well received but whether the situation improved is not recorded in the minutes.

Other legislation.

Other legislation affecting pharmacy in the late Victorian and Edwardian era falls into two distinct categories, firstly, constitutional and membership issues of the Pharmaceutical Society culminating in the 1898 Act, and secondly, Government legislation, mainly for the control of poisons, brought about in the Act of 1908

The Pharmaceutical Society had introduced a series of unsuccessful Bills in the hope of increasing membership and hence much need revenue. Part of the problem was the early, elitist attitude of the Society which denied full membership to chemists & druggists, but modifications in succeeding Bills made them more acceptable to the Edinburgh Association so that it was able to give its support to the 1894 Bill. This Bill failed but that of 1897 was successful and became the Pharmacy Acts' Amendment Act of 1898 which gave full membership to all chemists & druggists.

It was the influence of the local Chemists & Druggists' Trade Associations throughout Britain which had brought about these changes in the Society's constitution. Membership of the Pharmaceutical Society in Scotland had stood at 324 in 1892 but had increased to 597 by 1902.

The Pharmaceutical Society and all registered chemists & druggists maintained that their protected titles of the 1868 Pharmacy Act were statutory, professional and personal, and could not be legally used by corporate bodies. This was the basis of the long series of unsuccessful Bills introduced by the Society from 1899 onwards in attempts to prevent the development of Co-operative Society and company pharmacy, then becoming very aggressive.

The Government in 1899 sought in Clause 2 of its Companies' Amendment Bill to allow companies to conduct pharmacy businesses and to use certain titles as "Trading Designations". The Edinburgh Association sent a "memorial" or petition on this matter to the Lord Chancellor and five other highly placed officers of state, setting out its arguments relating to personal qualifications and titles. Opposition from the Pharmaceutical Society and the local Chemists & Druggists' Trade associations caused the offending clause to be withdrawn. In response the Drug Companies' Association was formed to advance their interests and was successful in blocking later Pharmaceutical Society Bills.

In 1904 during the drafting of these Bills, the Association sent a "Motion" to the Society's Council which was included in the 1905 Bill; like its predecessors it was unsuccessful.

The new Liberal Government in 1906 introduced its Bill on pharmacy and poisons, a Bill which failed owing to the vigorous opposition of the Society and the chemists & druggists. It was recognised, nevertheless, that the Poisons Schedules required revision and the Edinburgh Association sent detailed recommendations to the Pharmaceutical Society.

The Association's Minute book in 1907 described this period as "the Crisis created by the action of the Joint Committee on the Government's Bill". The Bill was proposing to license certain unqualified poison vendors and, once more, to allow companies, under certain conditions, to use as "Trading Designations" such titles as chemist or chemist & druggist.When the Government re-introduced its Bill in 1908, pharmaceutical circles of all persuasions realised that it would be better to try to "mend rather than end" the Bill. Opposition was withdrawn when certain modifications were granted. The Bill then became the Poisons and Pharmacy Act of 1908.

The Act allowed companies to use the titles of chemist etc. provided qualified personnel were employed in certain positions, all under the legal surveillance of the Pharmaceutical Society. It also established the "listed sellers" of agricultural and horticultural poisons if a licence had been granted by a local authority. This was opposed by the Association but unsuccessfully.[3]

As it had been in legislative matters so also was the Edinburgh Association active in other commercial interests. It became a member of the Federation of Local Pharmaceutical Associations (established 1895), collaborated in distributing circulars, and arranged meetings in connection with the Proprietary Articles Trade Association founded in 1896 to combat price cutting, then very prevalent. It was a member of the Chemists' Defence Association, started in 1899 for the legal defence of its

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subscribers. Finally from 1909, the association supported the parliamentary candidature of Mr Glyn-Jones whose election to Parliament in 1910 was very beneficial in the framing of the National Insurance Act of 1911 - but this takes us beyond the span of the Minute Book.

The author of this paper would like to conclude by saying he was apprenticed to a former member of the Association. Indeed, the minutes record correspondence from him on several occasions, mainly on legal topics. On his recommendation, the writer, a youthful callow apprentice, began in the early 1930s to attend the evening meetings of the Pharmaceutical Society in Edinburgh. On several occasions he remembers seeing Mr Peter Boa under whose auspices the Association had been inaugurated in 1892, and recollects him as being an impressive, bearded, patriachal figure.

Notes

1. The weekly wage for unskilled workers was about £1 at that time.
2. Professor Christison was the first Privy Council Visitor to the Pharmaceutical Society's examinations in Scotland.
3. The Act also gave the Pharmaceutical Society greater flexibility over education and examination with beneficial results in years to come.

An added interest to holidays abroad is noting the style of the local pharmacies, many of those in Europe being of an architectural magnificence never attained here. This one was 'spotted' last summer in one of the main streets of Trondheim, Norway. The following the plaque had been placed on it:

Sommergården
Bygd. 1774-77 for Hoffagent og Apoteker Otto Sommer.
Ombygd for Apoteker C.F.Møllerup 1832-35.
Svaneapotekers Lokaler fra 1835. Ny ombygging 1957-60.
Overtatt av Norges Samemisjon 1974.

Which (hopefully) was translated as:
Sommergården
Built 1774-77 for agent to the Court and pharmacist Otto Sommer. Rebuilt for Apothecary C.F.Møllerup 1832-35 [and was] the premises of the Swan Pharmacy from 1835. Renovated 1957-60.
Taken over by the Norwegian Lapp Mission in 1974.

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THE JURITZ CATALOGUE.

Dr Patricia McMagh, the author of *The Three Lieschings* reviewed in our last number, has been kind enough to send us a photocopy of a catalogue produced by the successor to Dr. Liesching's pharmacy, the "Engel Apotheek" or "Angel Pharmacy" in Loopstraat, Capetown, South Africa. The cover proclaims that it now belonged to a Dr C.F.Juritz and that the catalogue was a ninth and enlarged edition. It is written in Dutch and seems to have been been produced in the early 1870s.

There are 72 medicines listed which vary from his own composition of "Balsem Opodeldoc" which he claims to be far superior to that of Dr Steer's, to Eau de Luce which was recommended for "the bite of snakes and other poisonous animals", or Roche's embrocation used against whooping cough. He also sold Dr Gregory's Stomach powder, "this famous and excellent medicine", an elixir against bile and phlegm which was of his own invention, and blood purifying herbs. Medicines which are obviously of local origin were Concentrated Buchu Vinegar and Buchu Essence, a teaspoonful of the latter being taken in a small cup of water or brandy.

Napoleons Borstpillen or Napoleon's Chest Pills.

(Volgens het origineel recept) (According to the original receipt)

"These were highly prized by the Emperor as the best cure for difficult breathing, coughing and the dificult loosening of phlegm. An authentic copy of the prescription was given us by a friend, and the pills have been used here with good results"

Kindly translated by Dr McMagh.

Green Market Square and Stadthuis, Capetown. Charles Liesching's pharmacy was on the extreme right.

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Professor J.T.Mann, "Poisons, Potions and Folk Remedies: Nature's gifts to modern medicine."

Society Members' Activities.

In 1990 Dr M.Earles assisted a colleague in a critical study of the events leading to the discovery of the sulphonamide drugs and penicillin. The results of that collaboration have recently appeared under the heading "Inductivism and its Critics" *in Philosophy of Science in the Twentieth Century* by Donald Gillies (Blackwell, 1993).

Dr Earles is also co-author of an introductory essay to *Correspondence, Invariance and Heuristics,* (Kluwer Academic Publishers, 1993), a volume of essays in honour of Heinz Post, Emeritus Professor of the History and Philosophy of Science, King's College, London.

Dr John Crellin, now living in Newfoundland, gave a paper entitled, "Spruce Beer and Cod Liver Oil in popular and professional medicine" at the July 1990 Dublin Seminar for New England Folklife held at Deerfield, Massachusetts. A short summary of the paper has appeared in *Medicine and Healing* (Boston University, 1992.)

Plymouth Conference, April 1993
Dr. & Mrs. W. Court with Mr. & Mrs. W. Jackson

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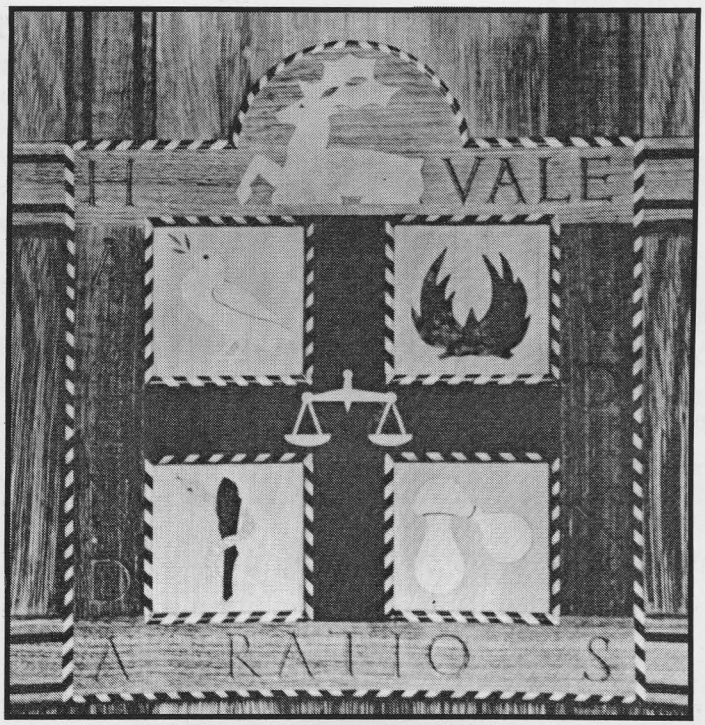
A UNIQUE CEREMONY IN PHARMACEUTICAL HISTORY.

G. Miller.

At a time when sporting relations between Britain and Australia were at odds on the cricket field over the bodyline bowling issue, it would appear that the harmony between the Pharmaceutical Societies could not have been higher. This was 1926 and at a meeting of the pharmaceutical societies of Australia and New Zealand held in Perth that year, a Sydney pharmacist, Arthur Kenny, proposed that a gift of some munificence should be offered by these societies to the mother society in Great Britain.

It was proposed that the gift would be in the form of a presidential chair, and would be so made as to serve as a constant reminder of the bonds between the kindred societies. The spirit of the gift was not to be confined to official and personal contact, but was also to be a symbol of the broad similarity of law and organisation, and agreements and reciprocal recognition of qualifications, that existed across the miles. As with many such ideas, it needed a great deal of personal effort to get things moving.



Inlaid panel of the presidential chair

In May 1930, Mr Kenny, who was by then the vice-president of the Pharmaceutical Society of New South Wales, visited the house of the Pharmaceutical Society of Great Britain and discussed the project informally with the Council. He was told that such a gift was likely to be warmly received. On his return to Australia he found that local support was readily forthcoming, and in July 1931, Mr F.P.Gray, a member of the Council of the New South Wales society, conveyed to London the formal offer, which was accepted.

Like all chairs made for ceremonial occasions, it had to be of a special character within a simplicity of general form. It had to be able to be seen from all angles, and at the same time conform to fixed dimensions. The chair was designed and constructed in England by Mr Eric Sharpe who had received approval for his design from the Australian Pharmaceutical Conference at their meeting in August 1932.

The body of the chair was made from Australian black bean, and a reproduction of part of the British society's coat of arms and motto was inlaid in the central panel of the upright back. Above, outline maps of Australia and New Zealand were inlaid with specimens of local timber collected and sent to England by each of the constituent Australasian pharmaceutical societies. The timbers selected were: Victorian mountain ash, New South Wales coachwood, Queensland walnut, South Australian dark sheoak, Western Australian sheoak, Tasmanian blackwood, New Zealand North Island mottled kauri, and South Island rewa-rewa.

When the chair was finally ready for presentation a special ceremony was organised during the British Pharmaceutical Conference in London in order to receive the gift suitably.

The event caused great interest, not so much because of the actual chair, but because of the use of the then novel technology of wireless to link the participants who were 12,000 miles apart.

The ceremony was held at Grosvenor House, Park Lane, and broadcast throughout Britain by the B.B.C. on 27 July 1933, and by arrangement with the Sydney to London Radio Telephone Service, a group of Australian pharmacists gathered at the Hotel Sydney was able to actually take part as well.

In opening the proceedings, the chairman of the Pharmaceutical Society of Great Britain asked the secretary Mr (later Sir) Hugh Linstead to "describe the scene at Grosvenor House, so that our friends in ... Australia will be able to picture what a happy family we are." Mr Linstead replied with, "It is 5 o'clock in the afternoon and the city is experiencing summer weather; outside this hotel the tar has melted in the road. On the platform beside me are the Secretary of State for the Dominions, Mr J.H.Thomas, M.P., the President of the Society, and Mr Eric Sharpe who designed the chair."

After naming some of the other guests present from Great Britain, Australia and New Zealand, he went on, "We are looking forward with the keenest anticipation to hearing your voices from Sydney, and especially the voice of our colleague and friend Mr Harold Finnemore.[1] But whether successful or not, it can make no difference to the feeling that exists between the Pharmaceutical Society of Great

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Britain and its sister societies of Australia and New Zealand. Whether our voices reach you clearly, or your voices reach us, should make little difference to the ties that unite and the common ideals that bind our organisations together. We hope that your voices may reach us, and even now, before we have heard them, we are conscious of your close proximity at this moment. There are 600 of us collected in London, and a dozen or so of you, our friends, are sitting round a table in the small hours of a winter's morning in Sydney. If you could see the real beauty of the chair you would realise how proud we are to be recipients of this wonderful gift."

Across the miles the Honorary General Secretary of the Pharmaceutical Association of Australia and New Zealand, Mr C.L.Butchers, described the scene in Sydney, "The venue of this memorable broadcast is the Elizabethan room of the Hotel Sydney, situated centrally in the capital city of the mother State, New South Wales. Twelve earphones have been specially installed in the room by the postal authorities. Around a central table sit the representatives of Australian and New Zealand pharmacy, headed by their President, Mr David Dunn. There is a smaller table at which are seated the representatives of the Australian press. In the room also are two synchronised clocks - one showing British Standard time and the other Eastern Australian Standard time. It is now 2 o'clock in the morning of Thursday 27 July, the middle of the Australian winter."

That was only sixty years ago, and today, if such an event were to be held, we would hardly give a second thought to the marvels of modern communication that use satellites to bring the world to our living rooms. It is also significant that the relationship between the pharmaceutical societies of Australia, New Zealand and Great Britain is still held in great respect, and reciprococity of registration for pharmacists moving between them is still preserved.

The chair itself still resides in the splendid halls of the British society, which of course is now the Royal Pharmaceutical Society of Great Britain, but it is a mere spectator, having been retired from active service because some presidents complained that the side wings on the chair restricted their hearing during Council debates.

This fascinating piece of pharmaceutical history came to light when the small bound book, which was the official record of the presentation ceremony, was located in the archives of the Health Department of Western Australia. The record was presented to each pharmaceutical society in Australia and New Zealand, and the frontispiece was inscribed with the words, "With the cordial good wishes of the members of the Pharmaceutical Society of Great Britain as an expression of their gratitude and as a memento of a unique ceremony." It was signed by the Secretary of State for the Dominions who had been chairman of the presentation meeting.

The ceremony lasted for 35 minutes. Two visitors to the Conference, Mr Philip Wheeler from Victoria and Mr A.H.Young from New Zealand, as well as alternate speakers on both sides of the globe praised, in what at times became quite mellifulous tones, the spirit of friendship and cooperation that prevailed between the mother society and the antipodean societies.

The parting words on this memorable occasion came from Mr Kenny, "I would like to emphasise the truth of an old saying: One look forward is worth two looks back, Kia-ora and Coo-ee!"

Notes

1. Mr Harold Finnemore was president of the Australian Association for the Advancement of Science, and lecturer in pharmacy at the University of Sydney.
2. The full report of the presentation of the presidential chair appeared in the Australasian Journal of Pharmacy, 30 August 1933.

More useful Documents.

The curatorial officers of the Royal Commission on Historical Manuscripts have again kindly extracted for us from their publication Accessions to Repositories (1992) the following documents:

The prescription books, 1901-79, of **Hickman & Son Ltd.**, pharmacists, Newbury,(now in Berkshire Record Office. (D/EX 1164); of the Spa Pharmacy, Cheltenham, 1904-76, (at the Gloucestershire R.O. (D 3893); of the **Bury branch of Boots Co. Ltd.**,1900-73, (with Bury Archive Service); of an unknown chemist in Liverpool, 1900-02,(Liverpool R.O.,MS 4859); and those of **Manders,** chemists of Malvern, 1837-99, (Hereford and Worcester R.O.)

Ledger and prescription books, 1862-1946, of **Robert Howden Ltd.,**pharmacists,at the Guildhall Library (MSS 23,957-58)

The receipt book of **Thomas Acaram Coate,** dispensing chemist of London and Bristol in the library of the Wellcome Institute, London. (MS.6954)

The correspondence of **Thomas Martin Lowry (1874-1936)** chemistry academic, in Cambridge University Library, Dept. of MSS and Archives, (Add. MS 8678)

Papers relating to the discovery and development of polyethylene,1936-56, at I.C.I., now held at the Science Museum Library.

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C.R.S.: PHARMACIST AND ARCHAEOLOGIST.

J. Burnby

Ambivalence has always been shown towards the pharmacist. He has been called a 'Jack-of-all-trades'- even if the rest of the tag was omitted. He was the man who could fix your camera, tell you which grass seed was best for your patchy lawn, and sell cosmetics to the hopeful but spotty teenager, yet at the same time could actually read, and even understand, the doctor's hieroglyphics, or snort in fury at the said doctor's receptionist's grosser errors. Yes, he was certainly versatile to use a kindlier description.

He had, and still has, many acquired skills, scientific learning to a remarkably high level, a depth and breadth of experience which has often taken him outside the sphere of pharmacy with great entrepreneurial success. If one looks at the achievements of some of these men, the fields which they have cultivated have certain links with pharmacy, but with others the connection is less obvious.

It is not at all surprising to find Alfred Bird (1811-1878) developing an eggless custard powder, or Frederick Benger (1840-1903) his famous peptonised food - we have always sold invalid foods. Nor are the mineral waters of Thomas Howell Williams (1843-1925, who later changed his name to Idris) and Albert Jarman Caley (1828-1895, who also became famous for his chocolate) or the effervescent F*ruit Salts* of James Crossley Eno (1827-1915) of any surprise to us, any more than are John Lea and William Perrin's *Worcestershire Sauce*, and George Weddell's (1856-1916) free-flowing *Cerebos* table salt. Soaps and cleaning materials are a common article of sale in pharmacies, so no eye-brow is lifted at Joseph Goddard's (c.1813-1875) non-mercurial *Plate Powder* or Robert Hudson's soap powder.

Other men moved out of the pharmacy and into different scientifically based fields, such men as George Frederick Watts, Samuel Jones and John Walker (1781-1859) with their *Chlorate Matches*, *Lucifers* and *Friction Lights*, and Sir Joseph Swan (1828-1914) with photography and, above all, the carbon filament lamp; Robert Drane (1833-1914) likewise diverted his attention to ceramics and natural history, particularly zoology.

Three men who seem to have distanced themselves even further from the pharmacy with great success were William Jones, Fenwick Bulmer and Charles Roach Smith.

William Jones of Pwllheli.

William Jones (1793-1855), the *Trade Directory* of 1835 tells us had his pharmacy in the High Street of Pwllheli, North Wales. This was the year, when aged 42, he built his first ship, and thereafter he never again figured in the directories as a chemist & druggist. An article on shipbuilding at Pwllheli relates that the town was once the most prolific ship-building centre in Gwynedd, and goes on to add, "The rapid expansion of ship-building at Pwllheli from 1835-1855, particularly with regard to the construction of ocean-going vessels, owed much to ... the entrepreneurial flair of William Jones of Brynhyfryd, Abererch."[1] William Jones, druggist, began his career as a shipbuilder with the brig *Ann* of about 300 tons burthen in the June of 1835. It was launched from his new shipyard at Alltfawr and was intended for the North American timber trade.

Thereafter he was shipowner, timber merchant and shipbuilder. The *Cyrus* was launched in 1837, the schooner *Salem*, destined for the slate trade in Porthmadog, in 1838. Soon he turned to larger vessels in which he usually retained a substantial interest. Many were over 400 tons and were for the India and China tea trade. His pride and joy was the *William Carey* of 659 tons which he and his son, Griffith, entirely owned.

Unfortunately we know nothing about his apprenticeship, possibly it had taken place in Caernarfon the nearest town of any size. It is probable that he was a product of the Grammar School at Pwllheli as he was born at Bodfaen only some four miles away, and when in 1847 the school had been closed for five years, its want was much lamented by William Jones. More research is required to discover his pharmaceutical background.

Fenwick Bulmer of Newcastle upon Tyne and London.

Concerning Fenwick Bulmer,(1745-1824) we know rather more. For one thing he had a busy pharmacy at No. 283 in the Strand, London, where he trained at least six apprentices, including William Butterfield, who was his apprentice in the late 1790s and eventually took over the business. His accounts are still extant at Drummonds Bank at Charing Cross, and show him dealing, for example in 1792, in large sums of money. At year's end however he does not seem to finish with more than a satisfactory positive balance, which makes it even more puzzling that in 1785 he became a member of the Band of Gentlemen Pensioners.[2]

This Band was constituted by Henry VIII in 1509 as a royal bodyguard which by the end of the eighteenth century had only a purely ceremonial function in which its members were in attendance in the Presence Chamber of the sovereign. It also of course conferred an enviable status upon its members; in 1782 the cost of becoming a standard bearer was about £3,000, and that of a Gentleman Pensioner a £1,000. As senior member Fenwick Bulmer was knighted by George IV on his accession to the throne in 1820.

Again we have no knowledge where his training in pharmacy was done, though it is probable that it was in Newcastle-upon-Tyne, his home town. We know from the Sun Fire Insurance records that his brother Blackett Bulmer, a painter, upholsterer, floor cloth manufacturer and undertaker, was in April 1779 already in business at No.293

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in the Strand, London, with a policy for £1,000 cover. In January 1781 Fenwick Bulmer was also established in the Strand, but as a "chymist & druggist" and with a policy for £700. Three years later, he too, in conjunction with a Samuel Roberts, had moved into the manufacturing of floor cloth; the manufactory was in James Street, Westminster, and was insured for £400, and their dwelling house next door to the pharmacy with stock and utensils, but no household goods, for £500.[3] It would seem that making floor coverings was a profitable affair.

It is probable that Fenwick helped another brother, William, a printer and twelve years his junior, in the founding of the famous Shakespeare Press. William was made one of the executors of Sir Fenwick's will, from which we learn that the pharmacist, Gentleman Pensioner and floor cloth manufacturer, owned a great deal of property both freehold and copyhold. After many generous bequests, including those to the Westminster Infirmary, the Philanthropic Society, and the Magdalen Hospital in St .George's Fields, he divided his estate between his two illegitimate children, Henry Morgan Bulmer and Mary Ann Adams, the wife of Pierre Desales La Terriere.[4]

Charles Roach Smith from the Isle of Wight.

Charles Roach Smith (1807-1890) was a quite different case from those already mentioned. He never obtained a handsome alternative income but rather, at his own expense, developed a new discipline, that of scientific archaeology.

The Dictionary of National Biography merely says that he was an antiquary, whilst Brian Hobley in his "CRS: Pioneer rescue archaeologist", describes him as "business man, collector and museum curator, traveller, prolific author, illustrator, gardener and student of viticulture and Shakespeare,... not a dilettante but a true professional." [5] He was in fact a chemist & druggist by training and a practising one until he was nearly fifty.

CRS, as he was known to his friends, was born on 20 August 1807 at Landguard Manor, near Shanklin on the Isle of Wight, the son of John Smith a substantial farmer. The Roach part of his name came from his mother, Ann, daughter of Henry Roach of Arreton Manor, a fine E-shaped Elizabethan and Jacobean building on the same island where he farmed some 500 acres.

Charles first school was at Brading, at an "establishment for young ladies" which he did not care for at all, but was soon sent to the school of a Mr Crouch on the mainland, firstly at Swathling, and then at Winchester. On Crouch's retirement, he was transferred to a larger academy at Lymington under a Mr Withers where he was made head boy. The question of his future career then arose. For a very short period he was in a solicitor's office in Newport,

Charles Roach Smith

Isle of Wight, but this did not appeal. He was promised by Admiral Moore a commission in the Royal Marines, as was already held by his brother Henry, but he would have to wait three years. In any case there was the even greater stumbling block that CRS was a bad sailor and abhorred sea voyages.[6] In the end, in February 1822 when he was 14½ he was apprenticed to a Mr Follett, chemist & druggist in Chichester.

He was by no means a born pharmacist and his friends, Henry Smetham and John Green Waller write that he found his apprenticeship tedious; indeed he called it, "the trial of my life." Fortunately his master had a good collection of books and amongst them was a copy of *Pinkerton on Coins & Medals* an interest which had been stimulated by finding a Roman coin in the shop's till. Thereafter he was completely hooked on everything Romano-British. He began to track down local coin hoards, to visit the Roman villa at Bignor, and to read all he could on the subject.

The end of his five year apprenticeship seems to have coincided with his master's financial collapse. Printed within Henry Smetham's book, *CRS and his Friends* are excerpts from a diary for the year 1827 which was in 1929 in the possession of Roach Smith's great nephew, Captain Charles Roach Smith, CBE., R.N., retired, then living at Sawbridgeworth. CRS wrote in February 1827 with all the contempt of untried youth, and one, who by his own admission, was always thrifty, "For a long time my stay with Mr Follett has been only to witness a continual series

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Landguard Manor, Isle of Wight

of humiliations and mortifications endured on his part, and the small esteem in which he is held by all those once called friends.... I can not pity the state into which Mr Follett is reduced, for he has been ever since I knew him extravagant beyond his means .... I truly sympathise with his mother and sisters, whom it is feared he has reduced to a state bordering on ruin." [7]

On Saturday 23rd. June, a Mr Weller took the valuation and the fixtures. The day after , CRS wrote to Mr Ashmore of Wilson, Ashmore & Co., wholesale druggists at Snowhill, London, asking for "his advice as to the best way of proceeding to obtain an eligible situation." Only two days later (26th.) with commendable speed, Mr Ashmore let him know that he could be employed in their "Warehouse Department".

In mid July Charles left Chichester and spent the next twelve days on holiday on the Island. On Thursday the 26th. with his sister Mrs Eveleigh and her children, he sailed from Ryde at 9 o'clock in the morning, and left Portsmouth at 10.30 a.m. on the Rocket, arriving at the White Bear, Piccadilly at 8 o'clock that evening. After spending the weekend at Gravesend with the Captain and Mrs Eveleigh, he reported to Mr Ashmore at Snowhill on Monday morning. He was taken to the warehouse, shown round and told that he would be working on the Wet Counter at first, with stints in the office.

Little is known about the firm of Wilson,Ashmore except that it seems to have been of some size. There was a Bark Room where CRS was also employed for a time, on one occasion noting that ten hundredweight were gathered together for sending to the mills. They also stocked quinine, for one of the managers, Thomas Hodgkinson, and Mr Minshall had an argument as to whether one particular sample was as good as usual. They also dealt at the Custom House, because CRS notes that he went there "with Jenkins and signed my name to a bond in the Bond Office; had some objections to so doing but complied owing to my reliance on the integrity of the firm." Besides putting up "Town Orders", young Smith wrote that he was very busy with export orders in November and had had to stay until 10 o'clock.

Roach Smith must have given satisfaction to his employers because on the departure of Mr Foulkes of the Wets Department, Mr Hodgkinson told him that "it was determined to place me at the head of it ". This elevation took place just after Christmas 1827; his salary was £70 a year.

At this period, CRS was certainly interested in his work. Sometimes he attended the lectures of John Flint South on comparitive anatomy at St. Thomas's, and also made notes on "chemical compounds etc." which most annoyingly the diary's editor has left out, deeming them uninteresting to the reader - and in any case probably not understanding them himself.

In due course CRS began to think of starting up on his own account. His mother died in 1834 leaving him some money, and by the following year Robson's Directory shows him to be established at No.47½ Lothbury on the corner of Founders' Court. It was a good choice because as he wrote, "perfect success attended my business, so that I could afford to be liberal in prosecuting my researches...." [8]

Just at this time, London was in a state of turmoil due to the activities of two bodies, the Commissioners of Sewers, who were building a new system of large and deep sewers which entailed digging down into the hitherto largely untouched mediaeval and Roman layers, and Richard Lambert Jones' City Improvements Committee which committed, amongst other vandalisms, the sweeping away of three Wren churches. Charles Roach Smith's earlier archaeological interests were now revived and strengthened owing to the vast amount of material which was coming to light.

Arreton Manor, Isle of Wight

In his diaries which which cover the years 1834 to 1841 and are now lodged at the British Museum, he records almost daily the pottery, glass, coins, sculptures, cinerary urns, wall paintings and mosaics unearthed by the armies of workmen. The authorities had almost no interest in this

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treasure trove which was destroyed and shovelled away as quickly as possible. CRS for his part collected as much as he could, buying from the excavators when he was able to leave the pharmacy, or from his "little band of juvenile watchers" who haunted the excavations and the dredgers scooping up needed gravel from the River Thames in which treasaure trove could be found. His most fruitful time occurred with the extension of the Bank of England which lay just across the road from his shop and home.

He became a Fellow of the Society of Antiquaries in 1836, not without a certain opposition because he had been very outspoken - and continued to be - about the lethargy only too evident within the Society. The British Museum was no better for it had no interest in British antiquities. There is no doubt Smith made enemies, not the least being what he termed the "City Authorities". There was certainly no regret on their part, perhaps even pleasure, when his premises were compulsorily demolished in order to widen Lothbury at the same time as Princes Street was straightened and also widened. He asked to be re-located nearby but this was refused him. He employed Counsel to fight his case, but in the end had to settle for a quarter of the true compensation value. This he had to use to defray the costs of moving to No.5, Liverpool Street, Bishopsgate, then a quiet and relatively obscure situation. In October 1840 he had to start his business again from scratch, but at least had the advantage that his new premises were commodious so that he could devote plenty space to his collections, or museum as he began to call them.

Even though he was pursued with a degree of malignancy by Jones, the City Dictator as he was nicknamed, and his architect William Tite, CRS re-doubled his efforts to save what he could because as he stated, "But for me the objects contained in it [his museum] would have been lost to Science." In a war of words he tried to goad the City Corporation into a more active and responsible attitude towards the antiquities they were so rapidly destroying. Sharp and contemptuous articles from his pen appeared in the new and already authoritive journal *The Builder,* in *The Gentleman's Magazine* and in *Archaeologia* In 1843, after brief discussion with archaeological friends in his home, he and Thomas Wright, formed the British Archaeological Association with the avowed intention of providing a popular forum for the preservation and study of British remains. Above all he began his *Collectanea Antiqua* which ran to seven volumes between 1848 and 1880. During these years he travelled widely, to Italy of course, and to Germany and France where he gained a great rapport with the French archaeologists.

But the time arrived when he had to write, "The years flew by agreeably enough, not a moment unemployed but the day and hour came when I had to think seriously on the future of the great collection of which I have said so much ...." [9]

The lease of his pharmacy and home would soon expire and his doctor had told him that a change to country living would improve his health. He set about preparing a catalogue, and in the spring of 1854, its 193 pages describing over thousand items was published by subscription.

He offered his whole museum to the British Museum for £3,000, the same sum of money as he estimated he had spent in gathering his treasure together in the last twenty years, but after waiting for three months for a reply, the offer was turned down without explanation. Times, however, were beginning to change, and a petition signed by over 250 eminent antiquaries was presented by Gladstone to the House of Commons, and the British public was aroused in support of CRS. The Trustees of the British Museum had their arms sufficiently twisted to make an offer of £2,000 - an offer which was accepted as CRS was convinced of the scientific importance of keeping the collection intact and not allowing it to be dispersed.

He spent the major portion of the money from the Museum on acquiring Temple Place, Cuxton Road, Strood, and some of the land around in order to protect himself from the encroachments of builders. Strood was an area he already knew well and loved. Kent was a county which was to supply him with plenty archaeological material as his books, articles and editorials published after his move in 1856 were to show. There he lived for another 34 years, first of all with his sister Maria, and then after her death in 1874, with one of his nieces Ellen Jolliffe, writing, studying and gardening.

Charles Roach Smith was far more than a mere collector of antiquities, more than the ordinary enthusiastic amateur. The scale of his collections was impressive, but more impressive still was the scholarly manner in which he published his accounts of them. He particularly understood the value of good draughtmanship in illustration, that drawings had to be simple rather than over-elaborate, and above all accurate.

He did not despise the non-spectacular. He collected not only coins, sculptures and wall paintings but glass, pottery and tiles, domestic utensils and leather sandals; nor did he confine himself to the more romantic Roman period, but saved pilgrim badges, seals and lead tokens, coins and weapons from the Anglo-Saxon and mediaeval times, periods which aroused little enthusiasm in those days. The waterlogged conditions near the Thames had allowed the leatherwork to be preserved, and CRS was able to make a most unusual and extensive collection, though unfortunately modern methods of conservation could not then be employed.

He firmly believed in the application of the scientific method to the study of archaeology. He wrote in 1836, at

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the time he became an FSA, that to the Antiquaries, "the furtherance of Science is not their real, though [their] ostensible, end", a view he was not to alter. To quote from the article on CRS by Dafydd Kidd, "He did not approve of vague generalities and theories sparingly supported by facts. He explored the technical aspects of pigments and mortar employed in wall paintings. He studied pottery fabrics and especially kiln groups in an attempt to trace trading patterns, identifying Northamptonshire pottery in London ...."[10] A friend's attempts to reproduce the various surface finishes found in Romano-British ware was of great interest to him. He posed questions and tried to find carefully reasoned answers.

What is never asked by any biographer is what caused CRS to follow this particular aspect of archaeology. Could it have been his early training and practice as a chemist & druggist ? It is true that he seems not to have had any great love for pharmacy, but nevertheless he must have learnt of the necessity for accuracy, the desirability of keeping good records, the careful observation of raw materials, and the value of care and attention to detail. It was particularly in the 1820s to 1840s that dosage forms were becoming more accurate and uniform, weights and measures standardised, labelling was promoted, the problems of adulteration and sophistication more seriously tackled and the *Pharmacopoeia Londinensis* began to catch up with research. In short pharmacy was on the threshold of the modern era, just as archaeology was slowly moving out of antiquarianism into the science-based subject of today - and Charles Roach Smith, chemist & druggist, was its herald.

Notes and References.

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4. Public Record Office, P.C.C., Prob.11 1686 f.337.
5. B.Hobley, "Charles Roach Smith,(1807-1890):Pioneer rescue archaeologist", *London Archaeologist,* 1975,vol.2,pp.328-333.
6. H.Smethan, *C.R.S. and his friends,* London, C.W.Daniel, 1929, p.28. Many of the Smith family, in spite of their farming background, joined either the Royal Navy or the Royal Marines, or else married members of those services.
7. Ibid., 1827 Diary.
8. C.R.Smith, *Retrospections: social and archaeological*,3 vols., 1883, 1886, 1891, vol.1, p.120.
9. Ibid., vol.2, p.223.
10. D.Kidd, "Charles Roach Smith and his museum of London antiquities", *Brit.Mus.Year Book*, 1977, p.132.

Acknowledgments.

I am much indebted to Mrs Audrey Robinson of Enfield who first drew my attention to Charles Roach Smith, and for her generosity in allowing me to make use of her investigations.

Book Reviews.

In Service to American Pharmacy: The professional life of William Procter, Jr. by Gregory J.Higby.
Tuscaloosa, USA, 1992, University of Alabama, pp.xvi+288.,

ISBN 0-8173-0591-2. Price $34.95.

William Procter (1817-1874) has with some truth been dubbed the "Father of American Pharmacy" and Dr Higby's biographical study gives us a clear picture of Procter's important contribution. We are given a detailed discussion of the major areas in which this tirelessly active man worked, those of pharmaceutical education and professional organisation, of pharmaceutical science and practice with its emphasis on quality control, and perhaps above all as a writer and editor.

The British community pharmacist of today, harried and bedevilled by paper work, will read with amazement how Procter showed just what could be done in the "backshop" where he successfully applied the lessons of botany, physics and chemistry to his daily practice in an average pharmacy. A belief in drug quality with consistent potency was one of his guiding principles and he devised many practical drug assays. He was amongst the small minority of American pharmacists (and British too) who regularly tested the quality of the drugs used in his own shop.

Although only 22 years of age, he was one of the few pharmacists whose advice was sought by the College of Physicians of Philadelphia in 1839 when the second revision of the U.S.P. (1840) was set in motion. It is interesting to note that another man was a William Hodgson jnr. who had received his training at John Bell's of London. Early in 1840 further advice was asked from the Philadelphia College of Pharmacy, whereupon a committee of six was set up of which Procter was the secretary. This committee became a strong advocate of percolation for drug extraction, and also recommended 46 pages of purity tests for chemical drugs based on those of the *Pharmacopoeia Londinensis.* As Higby notes this was "the first co-operative project undertaken by medicinal and pharmaceutical groups"; it is reminiscent of the work carried out by the English pharmacist, Richard Phillips, protege of William Allen.

In 1850 Procter was appointed editor of the *American Journal of Pharmacy,* then the only pharmaceutical periodical in the USA, a post he was to hold for twenty years. A great admirer of Jacob Bell, he frequently modelled his editorials and articles on those to be found in the Pharmaceutical Journal. Like Bell he discussed the necessity for pharmaceutical organisation, continually plugged away at elevating the status of pharmacy, encouraged the improvement of educational standards and emphasised the value of increasing drug quality. The USA of his time was only too frequently the dumping ground of third-rate crude drugs. Procter demanded that imported

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cinchona bark should contain not less than a certain percentage of quinine.

He deplored the rise of factory-made medicines, seeing in this the death knell of scientific pharmacy in the shop. He used every means he could to encourage the retail pharmacist to make his own galenicals, particularly advocating the production of alcoholic fluid extracts by percolation, but in this he failed.

Procter in his editorials always lent support to the youthful American Pharmaceutical Association, founded in Philadelphia in 1852, of which he was to be elected president in 1862. Organisation together with improved pharmaceutical education, standards and practice, he proclaimed, as did Jacob Bell, would elevate the pharmacist's status in society. Procter did not agree with governmental intervention by means of laws and regulation believing them to be unnecessary. Here he must have parted company with Bell who had been instrumental in the passing of the Pharmacy Act of 1852 even though it was so emasculated in its passage through Parliament as grievously to disappoint him.

However a long trip to Europe in 1867 considerably changed Procter's views. He now began to call for laws regulating dangerous drugs, decried competition when it became too destructive, and did not hesitate to rebuke those pharmacists who fell below an acceptable level of practice. He had been much impressed by the standing and scientific achievements of the Continental pharmacist, levels which Britain was still struggling to attain.

When one reads a well depicted study of a man and a career such as has been drawn here, one is almost inevitably led to wonder what he would have thought of pharmacy today. One thing is sure, he would have been amazed at the change in orientation that the profession has taken. Altogether a stimulating and thought provoking book.

J. Burnby.

The Development of American Pharmacology. John J.Abel and the shaping of a discipline, by John Parascandola.
Baltimore and London, 1993, John Hopkins Univ., pp.xvii+212,
ISBN 0-8018-4416-9. Price £24.50.

When Oswald Schmiedeberg died in 1921 some forty of his former pupils held professorial posts and were engaged in establishing his concept of pharmacology as an experimental biological science distinct from materia medica. Among them was John J. Abel the founder of American pharmacology. His career is described in this book and is based on research in the Abel archives at John Hopkins where he was appointed Professor of Pharmacology in 1893.

The principal themes of the work are the introduction and the professionalisation of pharmacology in America. The growth of academic pharmacology in the medical schools is described. This chapter also includes a reference to pharmacology in schools of pharmacy where, as in Britain at a later date, pharmacy teachers, with a few notable exceptions, were slow to abandon materia medica for modern pharmacology. Conservatism and differing ideas on the role of the pharmacist were factors but the problems of obtaining suitable laboratory facilities and qualified teachers in the new discipline also played a part.

A key event was the founding of the American Society for Pharmacology and Experimental Therapeutics in 1908. This development, however, revealed a deep division among pharmacologists. Those who worked in the expanding pharmaceutical industry were deemed to have sold their scientific souls to the "pill-peddler" who employed them. This opinion, although not peculiar to America, became dogma when from 1908 industrial based pharmacolgists were barred from membership of the Society for Pharmacology and Experimental Therapeutics. This lasted until 1941 and one is not surprised when the author informs us that it was unique among American professional scientific societies.

This book by the Chief of the History of Medicine Division at the National Library of medicine, Bethesda is an interesting contribution to the growing body of knowledge on the emergence, development and professionalisation of new scientific disciplines. The volume is illustrated, has extensive notes and references and a bibliographical essay to facilitate further reading on the subject.

M.P.Earles.

Other books to note.

E.R.Frizelle, *The life and times of the Royal Infirmary at Leicester: the making of a teaching hospital,* 1766-1980. Leicester. Leicester Medical Society, 1988.

F.G. St.Clair Strange, *The history of the Royal Sea Bathing Hospital,* Margate,1791-1991, Rainham, 1991, Meresborough Books.

Correspondence - and a correction.

Mr R.M.Howitt of Winterbourne has written, "On page 2 of your otherwise admirable edition of June 1993, while one may accept that at times some may have called it the "Ministero dell' Inferno" (Ministry of Hell), I believe this should read "Ministero dell' Interno" (Ministry of Home affairs)."

Oh dear! How right you are Mr Howitt.

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OUR GREAT CORDIALL.

M.P.Earles.

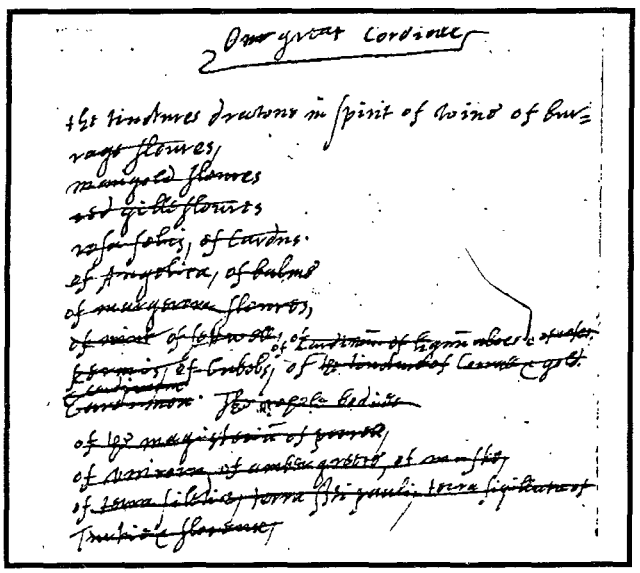
The formula for Sir Walter Ralegh's cordial was admitted to the *Pharmacopoeia Londinensis* in 1721 as *Confectio Raleighana.* it was derived with little change from that of Nicolas le Fèvre, Royal Professor of Chemistry and an Apothecary-in-Ordinary to Charles II who, on 20 September 1662, as recorded by John Evelyn in his diary, gave a discourse on the cordial in the presence of the King. The pharmacopoeial entry gave official recognition to the celebrated remedy but did so in a form very different from that devised by Ralegh during his sojourn in the Tower of London.

Ralegh was accused of treason in 1603 and was tried in Winchester. The trial was a travesty ending in the death sentence. Shortly before the day of execution Ralegh was taken to London where he was to spend the next thirteen years in the Tower. He was given a limited freedom within the walls of the prison and facilities to work and write. It was during this period that he wrote his History of the World. In 1605 Sir William Waat, Lieutenant of the Tower, reported that Ralegh had converted a hen house in the Tower garden into a still-house where he spent much of his time in distillation.[1] Other reports indicate he was not working in isolation but associated with his fellow prisoner and friend Henry Percy, 9th. Earl of Northumberland, the so-called "Wizard Earl" because of his interest in astronomy, chemistry, alchemy, mathematics and magic. Visitors included Thomas Harriot, described as one of the most original scientific intellects of the Elizabethan period, and Theodore Turquet de Mayerne who was largely responsible for the introduction of chemical remedies into the first London pharmacopoeia in 1618.

The notebook in which Ralegh recorded his chemical work in the still-house survived and shows that his major occupation was the preparation of Paracelsian chemical remedies, the majority involving the use of either mercury or antimony.[2] In addition the holograph has notes on medicines and pharmaceutical formulae, some of which were later to be included in a book of recipes. Ralegh was well versed in materia medica. The drugs to be found in Virginia were reported to him by Harriot, and he himself discovered a wound balsam during his expedition to Spanish Guiana.[3] This together with the reports of his experiments in the Tower earned for him a reputation for medical and pharmaceutical knowledge.

The accounts of the origin of Ralegh's cordial vary, but all have a common factor in the persons of Anne of Denmark, queen to James I, and her eldest son Henry, Prince of Wales. Mother and son were friends of Ralegh and both had petitioned for his release. In 1612 Henry was taken seriously ill and Anne begged to be allowed to administer a cordial prepared by Sir Walter Ralegh. When eventually permission was given Ralegh sent the cordial to the Queen informing her that it was effective against all illness except poisoning. This claim led to dark suspicion when the remedy failed to revive the dying prince.[4]

The formula for "our great Cordiall" occurs towards the end of the Tower notebook.[5] As the illustration shows each ingredient has been scored through and it may be assumed that this was done at the time a copy was being made. It suggests this was a rough note from which a more organised formula was to be composed. The following page in the notebook has been removed and it is possible that this sheet was used for the revised formula.



Erased formula for the Cordial in Ralegh's notebook.
Sloane MS 359, British Library

A transcription of the formula is as follows:

Our great Cordiall.

The tinctures drawne in spirit of wine of burrage floures,
marigold floures
red gillefloures
rosa solis, of Cardus.
of Angelica, of balme
of margeram floures,
of mint of settwell, of cardimomum of lignum aloes & of sases.
[———mom ?]
Kermis, of Cubebs, of the tincture of Correl & gold.
Cardimon.[?]

The whole bodies
of ye magisterum of pearle,
of unicorn, of amber greece, of muske,
of terra silesiae, terra Sti pauli, terra sigillata of
Turkie & florence.

A refined version of the formula for the cordial is included in a manuscript in the library of the Wellcome Institute for the History of Medicine. It is a handwritten book of medical

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recipes and includes some of the chemical medicines that appear in the Tower notebook. It is tentatively dated circa 1625 and was "...transcribed out of Sr Walter Raleghs booke of receipts written with his owne hand and is done according to the originall in everie sillable." [6] The transcriber knew Ralegh personally for he observed at the beginning of an appended note on the "Magister of Pearle" that, "This that followeth Sr W.R. wrote with his owne hand and gave it to me...."

The formula is longer than the Tower formula with some items omitted, some added and some names changed, for example Melissa for Balm. It corresponds approximately in length to that reported to have been in the possession of Ralegh's youngest son, Carew, who died in 1666. This latter formula was known to Robert Boyle as recorded by John Aubrey in his *Brief Lives*.[7]

Great Cordiall

Flores boraginis	Ros: Solis	Coralorum
Anthos	flores: betonicae	Lignum Aloes
Heliotropii	Cardin	Sarzephras virginiae
Gargopillorum	Angelicae	Kermis
Ros: Damascen:	Melissae	Cardemomum
Violarum	Marioramae	Cubebae
Sambuci	Mynthae	Lapis bezvarticus(sic) in tota Substantiae

Valerianae Magisterum perlarum dulciae

Amber grisiae extractio	Radix gentianae	
Terra Sigillatiae	Radix Zedoariae	Radix aristolochiae
Baccharum Juniperi	Radix Tormentillae	rotund:

Transcript of the formula for Ralegh's cordial from a MS (c.1625) in the library of the Wellcome Institute for the History of Medicine.

The entry for the cordial in the Wellcome manuscript also has the directions for the preparation of the cordial. The following is a summary in which the orginal spelling of the ingredients has been retained:

Make the tinctures of the seeds, woods and roots with spirit of wine. Evaporate until the liquid has the consistency of honey and then add proportional quantities of Magisterum of Perle, Tincture of Corall, Extract of Amber Greece and Bezar. Make the tinctures of flowers with spirit of wine and bring them to the consistency of the cordial with a little Terra Sigillata and Bezars Stone, Perl, Corall and Amber. To avoid the tedious task of drying the herbs and flowers one may press out the juices, allow the liquor to settle, filter off the "green faeces or curd" and then evaporate to help preserve the "best vertues in the hearbes."

These manuscript sources refute two opinions concerning the cordial that occur frequently in biographies of Ralegh. The first is that the cordial was a distillate, an assumption arising from Sir William Waat's reference to the still-house and Ralegh's activities there. The second that Ralegh included in his cordial a secret remedy brought back from Spanish Guiana where, on the banks of the Orinocco, he saw plants of such variety "as were sufficient to make ten volumes of Herbals." [8] Among suggestions for this mysterious medicine are Ralegh's own Guiana balsam and the quinine bearing cinchona bark.[9]

The suggestion of a secret ingredient is an attempt to impose a rational scientific explanation for the reputed efficacy of the remedy. The formulae in the manuscript sources, however, place the cordial firmly in the context of a time when there was no clear distinction between the new learning of science, and magic which sought supernatural assistance in controlling nature. A time when it was believed that all natural things contained hidden virtues as observed by Friar Lawrence in *Romeo and Juliet:*

> O, mickle is the powerful grace that lies
> In plants, herbs, stones, and their true qualities;
> For nought so vile that on the earth doth live
> But to the earth some special good doth give:

These hidden virtues were the *arcana* of "chymicall physick". The virtues of the ingredients of the cordial, extracted by a "chymical" process were believed to act upon the heart and the vital animal spirits that mixed with the blood therein. The action of the subtle and volatile virtues on the heart and blood was comparable to the manner in which the penetrating volatiles of flowers operate on the organs of smell.[10]

Ralegh, having selected the ingredients for his cordial, instructs the operator to "drawe out the tinctures" and so release the cordial virtues. His belief in the process is confirmed in his *History of the World* where he wrote that one may "bringeth to light the inmost virtues, and draweth them out of Nature's hidden besome to humane use".[11] The skill involved was the extraction and preservation of the virtue of each item. Nicolas le Fèvre in his discourse on the cordial observes that pharmacy has been enlightened with the glorious lights of chemistry and "that onely is capable to separate exactly the pure from the impure, to preserve the virtue of whatsoever it works upon, without any loss of its volatil parts, and to draw out the very centre of the most fix'd things what nature hath therein implanted most essential and most specifick."[12]

In the years following Ralegh's death in 1618 the formula for the cordial was privately circulated and underwent considerable modification. A manuscript in the British library dated March 19th 1659 is entitled "Sir Walter Rawleigh's great Cordiall After Sir Robert Killigrewes way."[13] Killigrew was a courtier in the 1620s and his formula was similar in content to that of Ralegh except that sugar, syrup of lemons and syrup of red rose were added - an early stage in the medicine becoming a palatable confection. Of greater significance is Killigrew's

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interpretation of the uses of the remedy.

The purpose of this and other cordials was to raise the spirits of the patient and give renewed strength in cases of languor and faintness due to loss of sleep and age. It was also to be given when there was a dissipation of the vital spirits such as occurs in childbirth and fevers. Killigrew recommends the cordial for all of these conditions but goes on to say, "It will drive all venoms from the hart if taken in time after pyson", thus contradicting Ralegh who is reported to have clearly stated that the cordial was ineffective against poisoning. it would appear that by Killigrew's time the cordial was already evolving into an elaborate panacea, a process brought to completion by Le Fèvre, aided and abetted by Sir Kenelm Digby and Sir Alexander Fraizer, Charles' chief physician.

In his discourse in 1662 Le Fèvre outlined the virtues of all the ingredients of the cordial. Pearl, he observed, re-establishes the "dissipated and abated strength" and went on to say that it resists poison, the plague and gout. By elaborating the formula he extended its potential use. He added nutmeg and mace for the "stomachical" effects. Viper flesh was included because of its combatant action against leprosy, venereal disease and consumption. Altogether Le Fèvre increased the number of ingredients to more than double the number in the original preparation, and it was this version that became Ralegh's Cordial after the formula was published in a French edition of the discourse in 1665.[14]

In Britain in the mid-eighteenth century there was a reaction against complex pharmaceutical formulae and a growing antipathy towards panaceas. Thomas Birch referring to Ralegh's cordial in an edition of the collected works observed that, "the composition has so mixed with an excessive number of ingredients as has of late lessened its reputation."[15] The formula for the cordial in the *Pharmacopoeia Londinensis* of 1721 was based on that of Le Fèvre. The committee entrusted with the revision of the pharmacopoeia between 1738 and 1745 changed the name of the preparation from *Confectio Raleighana* to *Confectio Cardiaca* and reduced the formula to just ten ingredients, replacing all the non-vegetable solids with Compound Powder of Crabs' Claws which was composed of crabs' claws, prepared pearls and red coral

It may be argued that if the 1746 London pharmacopoeia had retained the cordial in its Le Fèvre format it may have disappeared later in the century along with Theriac and Mithridatum. The process of simplification, however, ensured the perpetuation of Ralegh's cordial in a vestigial form. In the London pharmacopoeia of 1809 *Confectio Cardiaca* became *Confectio Aromatica* and the Compound of Crabs' Claws replaced by oyster shells *(Testae Praeparatae).* In the first *British Pharmacopoeia* in 1864 the confection was revised again and re-named *Pulvis Cretae Aromaticus* - a preparation that remained in common use well into the twentieth century for the treatment of gastric and intestinal disorders.

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Acknowledgments.

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PHARMACEUTICAL HISTORIAN

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Contributions to the Editor: Dr. J. Burnby B.Pharm., PhD., FRPharmS., FSA. 36 York Place, Edinburgh. EH1 3HU

Contents.

Diary Dates.

Wednesday, 9 March 1994.
The Foundation Lecture.
Dr H.M.Smalley, Managing Director of Macfarlan Smith Ltd.
"Pharmacy in Edinburgh."

Friday - Sunday, 8-10 April 1994.
The Spring Conference to be held at the George Hotel, Nottingham.

Society Members' Activities.

On 28 October 1993 Mr F.H.Rawlings gave a lecture on "The Cholera Epidemic in Bristol, 1832" as part of the University of Bristol's course, "The Healing Art: A continuing study of the history of medicine."

At the *Dental Practice in Europe* meeting held at Liverpool on 2 and 3 October 1993, Dr Burnby gave a paper entitled "Evidence from the Derby Mercury, 1790-1800, for dental services and products in the North Midlands." This group of international researchers is carrying out work into the practice of dentistry in Europe at the end of the 18th. century; papers were read from France, Britain, Hungary, Italy and Germany. The idea and the organisation are largely due to Dr Christine Hillam.

On Sunday 8 August 1993, a watercolour painting which had been commissioned to honour the memory of a former member of BSHP's committee, Harry Burlinson, OBE, FPS, DBA, was presented by his widow, Mildred, to Joyce Evans, the manager of Birdsgrove House. The painting by Shirley Ann Nunn had been purchased with the proceeds of a fund inaugurated by the manchester Pharmaceutical Association, and illustrates 22 plants and other items associated with tabletting around a bronze mortar and pestle.

Harry had served on the Tablets and Capsules Committee of the *British Pharmacopoeia* for 25 years and was the author of a book on tabletting technology. He had been chairman of both the Manchester and Salford Branch, and of the 1968 British Pharmaceutical Conference, and was awarded the Harrison Memorial medal in 1971 and the OBE in 1984. He also served on the ABPI Standard Formulary Medicines, and the British National Formulary Committees.

The painting now hangs in the lounge at Birdsgrove House. A limited edition of a framed 15" x 20" colour print at £30 is available. The profits are to be used to establish a grove of Alder Buckthorn at Oaken Clough where it is hoped that Brimston Butterflies will be bred.

Three BSHP members were among those present at the presentation, Dr G.G.Benson, Mr W.A.Jackson and Miss Irene Harris.

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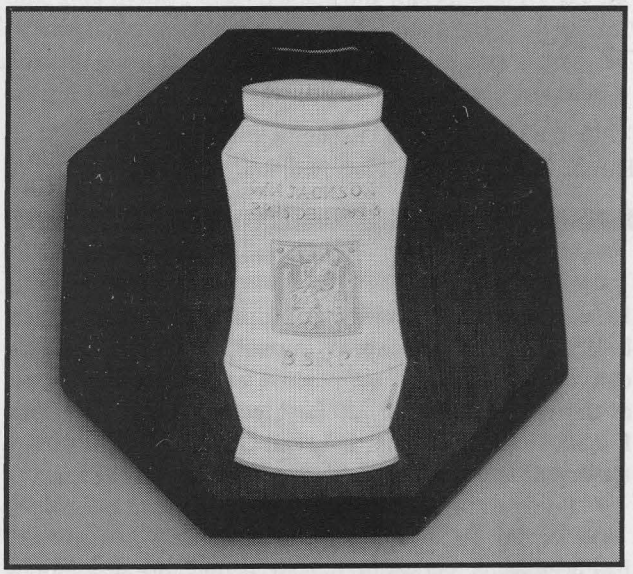
Presentation to Mr W.A.Jackson.

At the Committee meeting of 11 May 1993, the President, Mr W.A.Jackson, handed over the badge of office to Dr. David Jack. That evening we were to hear Mr Robert Blyth, former editor of the Pharmaceutical Journal give his talk, "Caveat lector", but before that took place Bill Jackson was in for a surprise.



Silver Albarello inscribed with the Society's Logo

Earlier in the year it had been unanimously agreed that the Society wanted to commemorate Bill's outstanding work for BSHP by a small gift, a mahogany plaque on which was inlaid a silver albarello drug jar. For once in life Bill was bereft of words!

Pharmaceutical Reminiscences.

The editor of the *Historian* has not been backward in urging Bill give us some reminiscences of his years in pharmacy and after a certain amount of pressure was applied this is what he produced.

"Having looked back over my life in pharmacy, it seems to have been singularly uneventful. However, I have jotted down the memorable bits.

1950 to 1951. My post-graduate apprenticeship in Manchester was with a manufacturing and whole chemists. Salary £5 per week. I was engaged as the assistant to a departmental manager, only to discover on arrival that he had left. I immediately was in charge of the tablet and ointment assembly benches, the DDA (now CD) room and the special dispensary where batches of five gallons or less were made, as well as suppositories, pessaries, doctors' special mixtures etc.

It was marvellous experience but a bit traumatic on occasions. When a batch of lozenges were ordered there proved to be no drying oven and one had to be made from a biscuit tin, or when a batch of pills for racing pigeons was required and the pill machine had to be borrowed from a local pharmacy.

The building was an old textile mill and there were gaps of up to an inch between some of the floorboards, so if we spilt anything there were cries of dismay from the man in charge of the dry bench on the floor below who had to rush about covering his stock with sheets of brown paper. The tablet-maker in the next department spent at least 25% of his time lovingly tending his ancient bicycle. The managing director's son came to do his apprenticeship when I had been there some months, and I have fond memories of him dashing from place to place carrying a piece of paper when he had nothing to do.

There was a major influenza epidemic that winter and we worked 72 to 80 hours a week while it lasted. Being classed as staff, I was not entitled to be paid for the extra hours worked, but I remember being given £5 (tax free) in recognition of the some seventy to eighty additional hours I had worked

1951-1952. I became a works chemist at a manufacturing chemists in London. I remember that we made Ephedrine Nasal Drops by drawing off two gallons of Liquid Paraffin from a forty gallon drum, heating the remainder on a gas ring, adding the Ephedrine and Chlorbutol, screwing the cap back on and then rolling the drum up and down the pan house.

The "Great Smog" (if my memory is correct, it killed about two thousand people) descended on London while I was working here, and our van drivers had to abandon their vehicles when it became too thick to drive. By this time one driver had lost his way and it was three days before we were able to find his van again. Being in the South, the employers classed New Year's day as a normal working day, but the workers didn't and by mid-day most of the girls on the filling and packing lines were hopelessly drunk, so that we had to close the factory. As I left for home, I was shaken to see a conga line emerge from the factory next door. It was led by a woman who must have weighed eighteen or twenty stones and was clad only in a pair of purple knickers. It made a profound impression on my young mind.

1952 to 1953. I became works manager of a small manufacturing chemists and also manager of one of their retail pharmacies situated in a London street market. We used to buy fresh flowers from the woman who had the pitch outside the shop. On any day on which we didn't buy at least one bunch, trade would mysteriously dwindle

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to almost nothing. At times the shop used to take on the look of a conservatory. This shop had the first open dispensary I had seen, being separated from the shop only by a line of differently coloured tiles in the floor. The managing director's German Shepherd dog used to live in the dispensary and she allowed nobody to cross that line unless they were accompanied by a member of staff.

1953 to 1958. First of all I became an assistant and then superintendant pharmacist in retail. When I joined the company, the superintendant was a Scottish pharmacist in his seventies. The first thing he did each morning was to brew a pot of strong tea. After pouring the first cup, he put the pot back on the gas ring on a very low light, and at intervals would pour himself another cup of tea, re-fill the pot with water and place it back on the gas. This lasted for four hours, and the whole process was repeated in the afternoon.

The shop was in Isleworth, and on Sunday, my wife and I used to walk down to the London Apprentice for a drink, then be rowed across the river by a ferryman and walk down the towpath to Kew Gardens, or up-river to Richmond.

1958 to 1962. Retail pharmacy in Derbyshire. When I first went there people would come into the shop, start with surprise and say, "Where is he then?"

"Do you mean Mr Hartley ?" (The previous manager)

"Aye"

"He's gone to manage another shop".

"Do you mean he's left ?"

"Yes. Can I help you ?"

"No. I won't bother". Turn round and go out again.

This went on for several weeks, but eventually both my wife and I were accepted and we found the people to be both warm and friendly.

There was another influenza epidemic while I was at this shop. I remember one day I opened the shop at 9.00 a.m., had my lunch and my dinner standing at the dispensing bench, and finally closed at 10.30 p.m. I was not pleased to be roused from my bed by the doorbell and be presented with a prescription for sleeping tablets which had been marked "Urgent" by the doctor. I dispensed the script, had a cup of tea, and then rang the doctor to ask if the script had really been urgent. That was the last urgent script for sleeping tablets I had from him.

In 1962 we moved to Manchester, and I have worked at various shops for the same company ever since, but nothing very eventful seems to have happened. I have known many customers, both pleasant and unpleasant, but few seem to have been remarkable. However, one couple who were in their eighties regularly used to buy five hundred grammes of nutmeg powder which they stirred into their bedtime coffee. As they had been doing this for many years, they were surprised when I told them of the potential dangers. I have often wondered if they continued to buy it from another chemist.

A gentleman in the East End of London, regularly used to eat his Bismuth Subgallate suppositories. He roared with laughter when I tried to explain the correct use and thought I was pulling his leg. One local "lady of the town" used to buy condoms from us, and if no other customers were in the shop, would haul up her skirts and spray the black lace underwear revealed with one of our perfume testers. Fortunately, by this time I was not the callow youth who had been so shaken by the conga line.

Finally, I remember a delightful Corgi that had once found a mouse in a cupboard at home, and was convinced that we must have some in the shop. To the embarrasment of his mistress, he insisted on being taken into the back and having each cupboard opened so that he could look inside."

We are now trying to bulldoze Bill into telling us about some of his adventures whilst hotly pursuing his fine collection of pharmaceutical bygones.

Gleanings from old newspapers.

Derby Mercury. 10 May 1792.

"The following recipe for the bite of a mad dog is hung up in Sunning-hill church, Berkshire:- 'Six ounces of rue picked from the stalk, and bruised; four ounces of garlick, bruised; four ounces of Venice Treacle and four ounces of scrapings of pewter. These are to be boiled in two quarts of strong ale over a slow fire until reduced to one quart; the liquor then to be strained off, and kept close corked in a bottle.

[Take] nine spoonfuls, warm, to a man or a woman fasting, for seven mornings successively; and six ditto to a dog. Apply some of the ingredients, warm, to the part bitten.' this receipt, our correspondent says was taken from Gathorp church in Lincolnshire where many persons had been bit by a mad dog. Those who used the medicine recovered; they who did not, died mad."

6 September 1792.

"Mr Preston Hornby, chemist of York, has communicated the following recipe for destroying bugs which we conceive may be extensively useful: Recipe, dissolve half a drachm of Corrosive Sublimate in quarter of an ounce of Spirits of Salt, and mix it with a quart of Spirits of Turpentine; shake the whole well together and wash all the places where the bugs are supposed to lodge with a brush, in the manner that rooms are white washed."

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18 October 1792.

"Recipe for the cure of a fever which is very prevalent. Take three ounces of the fresh juice of a Lemon; two drachms of Salt of Wormwood; one grain of Tartar Emetic, five ounces of Simple Spearmint Water, and Sugar as much as may be palatable. The whole of this mixture will make four doses for an adult, and may be taken at the distance of three, four, or five hours between each dose: younger persons may take two tablespoonfuls at the same distances of time."

19 July 1792.

"Industry. In a town in Cumberland, there is a person who labours in all the following vocations: he is a public baker; teaches a school; sells goods by auction; keeps a *druggist's shop* [our italics]; is clerk of the chapel; attends three markets weekly as a pharmacopulist [sic]; preaches three times a week to a small society of Methodists; is bellman of the town, and sexton; and dyes silk."

5 July 1792.

"Sunday se'nnight Mr Merryweather, apothecary at Greenhammerton, and Miss Gray of Wilstrop, Yorkshire, set off on a matrimonial expedition to Gretna Green. Few circumstances of this nature ever caused more bustle amongst the inhabitants of York. The lovers, on one horse, galloped most furiously through the principal streets of that city, closely pursued by a quondam admirer of the lady and another person who rode as furiously, vociferating, 'Stop 'em ! Stop 'em !'

They were stopped near the York Tavern, and one of the pursuers attempted to force the young woman from her pillion: she, however, threw her arms round the waist of her desired husband, and declared nothing on earth should part them. By this time they were surrounded by several hundred persons who, 'listening to the voice of love' espoused the cause of the fair fugitive, and called out for a chaise and four which was immediately procured from the tavern. - The young lady made but one step from her horse into the carriage - the lover followed - waved his hat as a token of gratitude to those who had protected them and bowled away to the land of Love and Freedom, amidst the unanimous acclamations of the numerous spectators. The unfortunate pursuers not being able to procure fresh horses, gave up the chace."

J.Burnby.

More Useful Documents.

Mr H.V.Roberts of Rosedale East, Pickering, has written to tell us that 37 prescription books from the pharmacy W.F.Gulliver, 6, Lower Belgrave Street, London, S.W.1, covering the period December 1831 to October 1912, together with six ledgers of customers' accounts, 1851-1910, and a ledger of suppliers' accounts, 1837 - 1861, were deposited in April 1988 at the City of Westminster Archives, 160 Buckingham Palace Road, SW1W 9UD.

Book Review

Zur Geschichte der Antimykotika in der zweiten Halfte des 19 Jahrhunderts by Urs Michael Humbel.

Basler Dissertationen zur Geschichte der Pharmazie und Naturwissenschaften: Basel - Juris Druck + Verlag Dietikon, 1993, pp.x + 177, ISBN 3 260 05350 6.

Prior to 1800 the general application of the Hippocratic humoral ideas obstructed the development of the local treatment of extermal infections. In addition, causal organisms of *Tinea favus*, ringworm, and microsporosis were not known and poor hygiene and social conditions enabled the rapid spread of such fungal diseases.

In a well-researched presentation Humbel traces the emergence of dermatology as a medical speciality with a gradual change from the use of empirical agents such as mercurial and sulphurous compounds to a more rational employment of purer chemicals.

Removal of hair follicles was essential for successful cure and the involvement of depilation with the brutal calotte or pitch skullcap, forceps depilation, application of vesicant croton oil, x-ray and radium depilation and use of thallium are discussed.

A wide range of formulae and parasiticides are considered, including metals such as mercury, antimony, copper, arsenic and lead, halogens (especially iodine), sulphur preparations, and tars and tar derivatives which included coal tar extracts (Wright's Coal Tar) and derived phenols, creosote, pyroligneous acid etc. Ichthyol, salicylic acid and reducing substances such as resorcin, pyrogallol, chrysarobin (Goa Powder), hydroxylamine, etc., are also described and the development and use of medicated soaps containing chrysarobin, naphthol, creosote, salol, sulphur, etc., is traced.

Scab removal, depilation and the use of iodine tinctures, Arning's solution of ichthammol and anthrarobin and Castellani's magenta/phenol/resorcinol paint survived well into the mid-twentieth century. The author outlines some alternative therapies that failed.

The text is liberally annotated with 568 footnote references backed up by 245 source references and 69 literature references. Famous names cited include Alibert, Castellani, Cazenave, Goulard, Unna and the British workers Attfield, Cottle, Squire, Plumbe and Wilson. Informative German, French and English summaries complete a text that is well worth study by historians and practitioners.

W.E.Court.

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THE BRITISH PHARMACEUTICAL CONFERENCE, READING.

History of Pharmacy Session, 23 September 1993.

Contributed by John Hunt.

Following last year's successful presence at the Conference the BSHP stand was for the second year, manned throughout the event. There was considerable interest in the stand, positioned close to the conference office, and much useful publicity was gained for our Society. Interest was ceratinly greatly stimulated by the new BSHP souvenir mugs which were on sale. These beautifully designed mugs are of Staffordshire bone china and depict the Society's well known logo based on a fifteenth century woodcut, together with depictions of the opium poppy drawn by an artist from the Royal Botanic Gardens in Edinburgh. Sales exceeded expectations with over three-quarters of our stock already sold.

At the History of Pharmacy session the Society was most fortunate to be addressed by Dr Norman Heatley, one of the small team who developed penicillin at the Sir William Dunn School of Pathology in Oxford where he was research associate of Sir Howard Florey. Dr Heatley's paper, **"Personal experiences in the Development of Penicillin"** described the difficulties in handling, manufacturing and evaluating a completely new and elusive substance.

Following earlier work on the anti-bacterial substance lysozyme, Florey decided to examine other substances with possible activity and he and Ernst Chain began to investigate substances produced by *Pseudomonas* and *Penicillium*. The latter was soon found to be the more interesting and other work was dropped, but little was done on penicillin until the early autumn of 1939 just prior to the outbreak of war. The *Penicillium notatum* mould was grown in small sterile flasks on modified Czapek-Dox medium for 10-14 days at 24 C, but an assay method was essential to control the process. Heatley devised the cylinder plate method of assay and the Oxford unit of activity. However more material was essential and various vessels were tried out for culture of the mould. These included biscuit tins, motor oil cans and bedpans. These experiments led to the design by Heatley of a flat rectangular ceramic vessel with a side neck, and quantities of the new vessel were manufactured by the potters James Mackintosh of Burslem. These proved successful and served to produce penicillin for about a year.

The evaluation continued and in May 1940, Florey demonstrated that mice were protected from virulent staphyllococcal infection by penicillin. Shortly afterwards, the treatment of an Oxford policeman, suffering from a mixed streptococcal and staphylococcal infection, demonstrated efficacy in man although unhappily supplies of penicillin ran out and the patient relapsed and died. Efforts to increase supplies continued and Heatley devised the counter-current extraction method for penicillin from the mould culture, using amyl acetate, and an apparatus capable of handling about forty gallons per week. Dr Heatley illustrated his talk with actual pieces of apparatus used in the pioneering work at Oxford and very kindly presented the Society with one of the original ceramic culture flasks.

The Society's stand at the B.P.C. with Mrs. Enid Lucas-Smith and Miss Ann Hutton in attendance

In answer to questions Dr Heatley confirmed that none of these early discoveries was patented, and that there was no sudden realisation of the impact of the work on the

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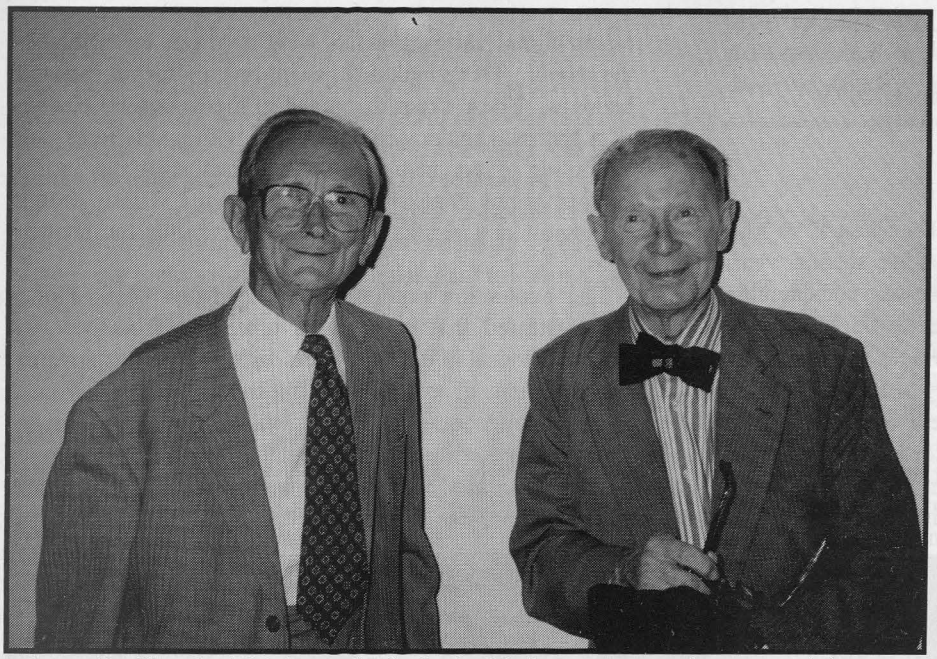


Dr. Norman Heatley with Mr. Leslie Mathews who was Secretary of the Therapeutic Research Corporation

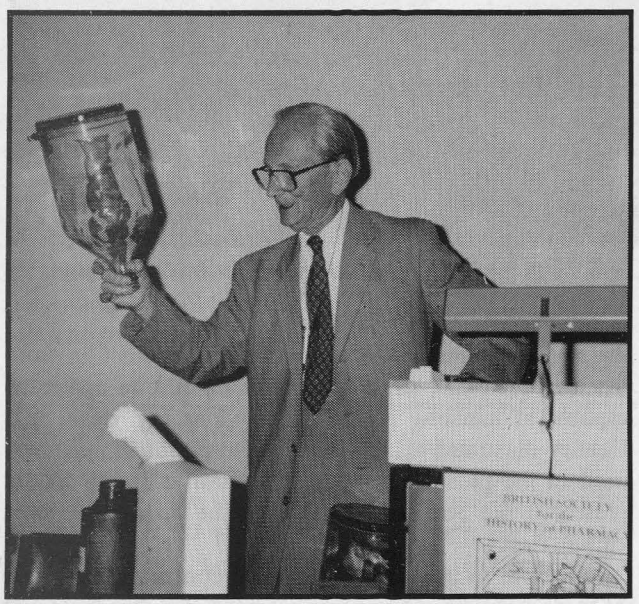
practice of medicine, rather a realisation over several weeks that a definate advance had been made.

Our second speaker was Professor John Mann of Reading University, author of the recently published book *Murder, Magic and Medicine,* (Oxford U.P., ISBN 0-19-855561-X)

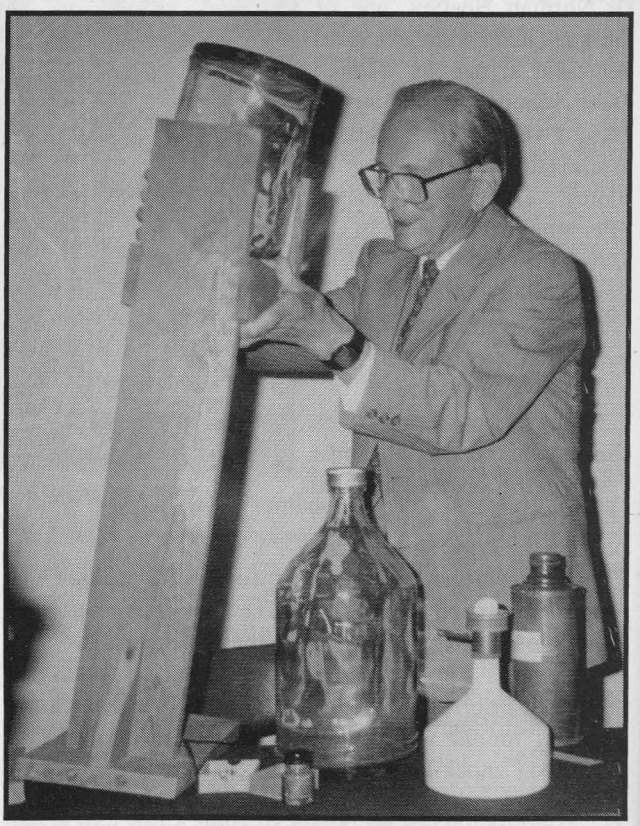
Professor Mann spoke on **"Poisons, Potions and Folk Remedies:** Nature's gifts to modern medicine".
The speaker enlivened his paper with numerous quotations from literature and began with reference to the Ebers papyrus of 1,500 BC, going on to describe the use of arrow poisons such as curare, leading to clinically useful drugs in surgery. A further example was the work of Dr William Withering on the use of digitalis in the treatment of heart disease.

The discovery by primitive societies that certain substances had hallucinogenic properties was thought to permit communication with the gods, resulting frequently in their reservation for use by the priesthood. A material used in this way by the Aztecs was found to be close in structure to LSD. The mushroom, fly agaric,*(Amanita muscaria)* contains hallucinogenic material and descriptions of Alice's experiences in *Through the Looking Glass* suggest that Lewis Carroll may well have been acquainted with its effects.

Long established remedies include senna, known in ancient Egypt as "Guardian of the royal bowel movement",



Dr. Heatley brandishing some of the original apparatus



Dr. Heatley demonstrating the equipment used in early penicillin production

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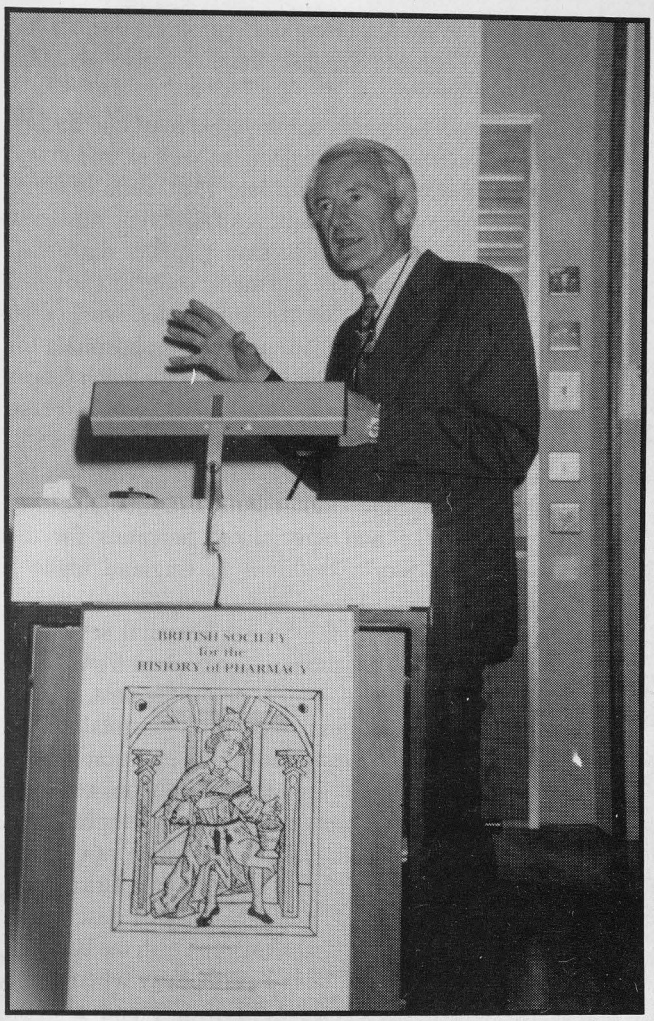

Professor John Mann

and ephedra, used in China since at least 3,000 BC and which led modern researchers to salbutamol for the treatment of bronchospasm. The speaker went on to describe the use of the drink absinthe during the nineteenth century, and the effects of its active constituent thujone, the neurotoxic constituent of wormwood. Moving to the theme of magic, alkaloids from mandrake, belladonna and hyoscyamus were among the substances used by witches, usually by transdermal application as "Witches' Ointment" which gave delusions of flying and other unlikely adventures.

Professor Mann concluded his paper by describing some recent work on nature's gifts to modern medicine. These included the anti-cancer vinca alkaloids from the Madagascan periwinkle, taxol from the yew tree also used in cancer treatment, and *Quinghaosu*, an anti-malarial from *Artemesia annua,* used in China for some two thousand years.

Fermentation - Man's oldest bio-chemical process.

K. Holland.

It is interesting to consider the progress of fermentation as a tool to produce new chemicals. The making of alcoholic drinks by using yeasts to ferment fruit juices - in particular the grape of course - goes back to the earliest recorded times. The process of brewing beer was probably invented by the Babylonians some six thousand years ago.

During the nineteenth century it was observed that the fungus, *Aspergillus niger,* when grown in sugary solutions, produced citric acid. During the 1890s chemists of the German company, Boehringer Ingelheim, tried to produce the acid in commercial quantities but failed. During their experiments however, they overheated the mixture and accidentally produced lactic acid. This lucky accident gave the company a most useful boost to their annual income.

It was in 1919 that a commercially viable method of making citric acid by fermentation was perfected by Dr James N.Currie working with the Pfizer Corporation in the U.S.A. His deep fermentation process by which large quantities of the acid could be economically produced also provided an ideal way of making penicillin using *Penicillium notatum* grown in a suitable substrate. Pfizer successfully produced sufficient quantities of the antibiotic to supply the needs of the armies that invaded Europe in 1944.

Since that time a number of antibiotics have been made by fermentation, using a variety of organisms, and which have been remarkably successful in defeating many previously intractable infections. Recently the fermentation process has taken a new role in producing medicines. By taking appropriately coded pieces of DNA and relocating them in *E.coli* or in yeast cells, hormones and vaccines have been produced in quantity. In 1980 human insulin was so produced, followed by a vaccine for feline influenza.

Hepatitis B vaccine, made by replicating a protein from the viral coat, was first produced in 1988 by SmithKline's Belgian laboratory to combat the spread of an infection which, if an effective vaccine had not been available, might have become endemic in the West as it has been for some time in the East. Other vaccines are in the course of development as are a number of hormones and other physiologically active proteins and polypeptides.

Recently this technique has been used to replicate pieces of DNA which, subsequently harvested, are inserted into harmless retroviruses. These viruses so treated, it is hoped, will provide a vehicle to transport missing or supplemental strands of DNA into defective cells to complement and so correct certain genetic diseases. Thus the oldest known device for making a chemical now provides the latest technique for making molecules of incredible complexity to combat disease.

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THE HOSPITAL STORY.

K.D.Richardson.

Hospitals arose as a special need in Roman society as for example that on the island of Tibor founded in 293 B.C. The Greeks, who dominated medicine from about 300 B.C. to 200 A.D. did not have more than "day hospitals", though a patient may have been kept over night in a physician's own home. The concept of a public duty towards the sick was largely negative being regarded as the duty of the head of the family.

The two types of Roman hospital created in the first century, were for slaves and for the army. These only dealt with common and gross symptoms. Slaves were a valuable property as they were becoming scarcer, and the conquests of Augustus after long, hard campaigns brought the need for permanent base fortresses, such as Bonn in Germany and Inchtuthil, Scotland (A.D.83-87), which were provided with hospitals. They were serviced by doctors, bandagers and trainees. In 399 A.D. in Constantinople, Fabiola, a wealthy Roman lady, established one of the first true hospitals which was followed by several others in Byzantium. One in Constantinople could accomodate some seven thousand patients.

In mediaeval Europe (500-1500 A.D.) hospitals offered a high quality medical care to the poor. Religious institutions built hospitals such as the Santa Maria Nuova of Florence in the 1280s,which two hundred years later had three hundred beds and employed nine doctors. Here we find (1567-8) the first known list of diagnosed patients admitted to a European hospital. First came fevers, then the next two largest categories of skin diseases (rashes, boils, ulcers and sores) and of trauma (wounds, fractures and bites). Diseases of the teeth and eyes were also common, as well as hernias; the mentally ill also figure prominently.

In the early Middle Ages only the monastic infirmaries isolated the sick from the healthy as may be seen in an idealised plan of St. Gall, c. 820, although it is doubtful if it were ever built. By the mid-11th. century, we are able to trace in detail the construction of actual infirmaries in monastic houses such as Cluny. Commoner were urban hospices that received the sick but also the needy in the lay population and gave only general nursing care.

The High and Later Middle Ages. (1050-1500)

It was in this period that the hospital evolved for the sick poor. In western Europe by the 13th. century there were about nineteen thousand hospitals, mainly simply providing food, shelter and prayer for pilgrims, the old, the poor and sick. Some were independent, others belonged to religious orders, as for example the military hospitals of the Knights of St. John (later known as Hospitallers) in the early 14th. century, and the Teutonic Knights; there was also the order of St. Lazarus.

Most of the larger hospitals employed at least one doctor, sometimes a physician and a surgeon, as well as midwives, barbers and apothecaries. By the late 15th. century some hospitals were separating patients with different illnesses. In Santa Maria Nuova, doctors saw patients daily and prescribed individual treatment and medication, all provided free of charge. Public health functions were also incorporated, including establishing isolation hospitals for epidemic diseases. Italy lead the way, it taking much longer before similar measures appeared in northern Europe. These hospitals were mainly for the acute sick, but in the 15th. century there was a growing preoccupation with chronic illness amongst the poor. Individuals and municipalities began to found large and specialised hospitals for the incurably ill. St Mary's Bethlem in England made a speciality of the insane.

One mediaeval hospital, the Soutra Hospital seventeen miles south-east of Edinburgh on the main road from York, is being extensively studied. It was a staging post, a day's ride from the Scottish capital, mediaeval hospitals often being obliged to provide accomodation and stabling to travellers, as well as medical, welfare and religious services. Soutra was a general hospital with a strong emphasis on public welfare. The Augustinian order which ran it was responsible for more hospitals than any other in Britain.

Soutra was in use for three hundred years. A description of 1444 says that the church, the centre of life in the hospital, was built at the top of a hill near a public way where there were often fierce winds and cold spells, and a great concourse of people labouring in their business. Infirmary accounts have been studied and also a herbal, copies of which were used at all Augustinian houses which had been written in north-west France in the 11th. century. Blood letting was a common practice and a cautious estimate of the amount of blood drawn off during the life-time of the hospital is around 290,000 pints.

The Restoration to Regency period. (1660-1800)

In 1714, John Bellers published his *Essays towards the Improvement of Physic.* Based on mortality studies he argued for medicines to be provided in order to save 100,000 people perishing each year from what he considered to be curable diseases. To this end he brought out a twelve point programme for legislative action which included the construction of hospitals for the destitute, blind and incurable.

After 1739, reformers obtained the admission of women in labour to the existing voluntary hospitals in London. Then between 1749 and 1759 a number of establishments were created in the capital exclusively devoted to maternity

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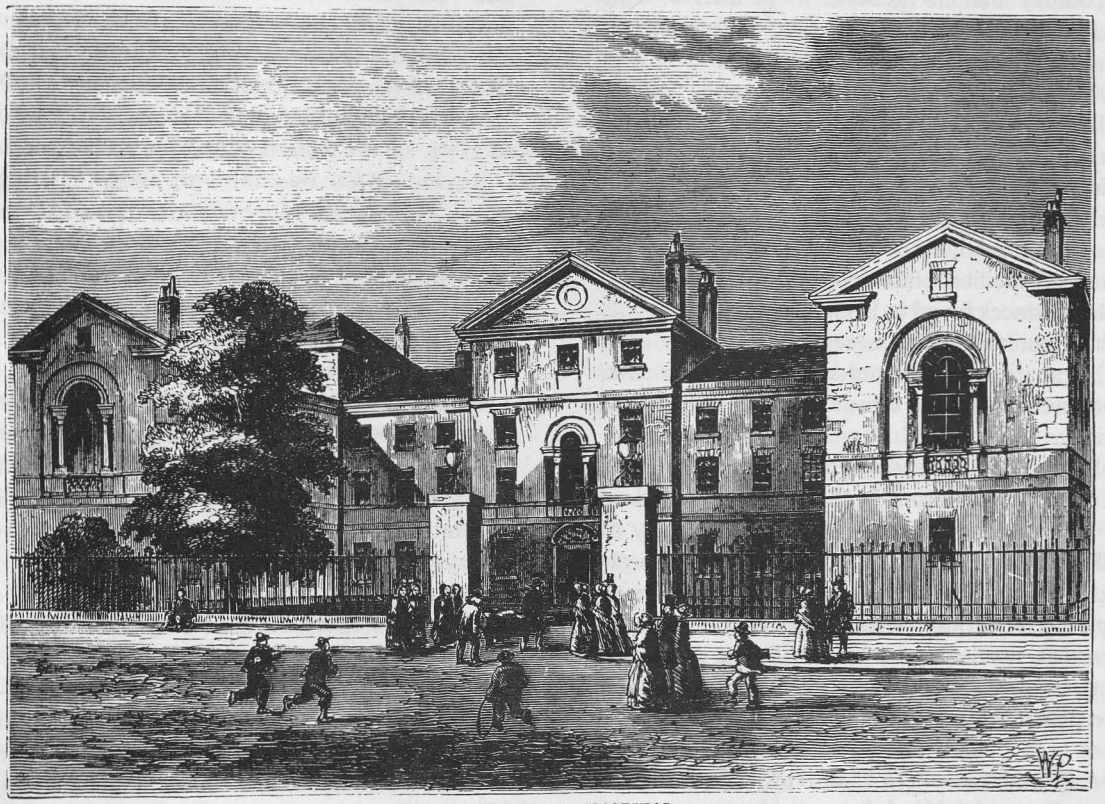
cases, these included the British Lying-in, City of London, Queen Charlotte and Royal Maternity Hospitals. As a result men-midwives gained greatly increased facilities for studying the subject.

Early in the 1700s growing urbanisation with its detrimental effect on the poor required the formation of infirmaries solely devoted to the treatment of the sick and injured. Thus in 1720 opened Westminster Infirmary, Guy's Hospital followed in 1724, St George's in 1733, the London in 1740 and the Middlesex in 1754. In 34 years a total of two thousand new beds were created. These foundations were soon imitated in the provinces where a number of local hospitals were created with the help of private donors. These institutions were for the working poor, paupers were returned to their parish of origin when they became sick.

The first specialist cancer hospital was built in 1740 in Rheims, France, from funds donated by a canon of the cathedral in an attempt to isolate the disease which he thought to be contagious. In 1791 the brewer, Samuel Whitbread (1720-1796), endowed a cancer ward at the Middlesex Hospital for research purposes, whilst in 1827 William Marsden opened a dispensary for the poor in London which became known as "The Royal Free and Cancer Hospital". The word "free" signified that unlike other hospitals no letter of recommendation was required before admission.

The Royal College of Physicians of Edinburgh in 1725 launched an appeal to start a hospital for the sick poor, and on 6 August 1729 the first Scottish teaching hospital, of four beds, was opened. It was soon over crowded and within nine years a 228 bed hospital, housing an operating theatre with two hundred seats for students, was started in Thomson's Yard, near to Infirmary Street. The first wing of 34 beds was completed and in use by 1741. A "Surgeons' Shop" or pharmacy was fitted out in 1747 on the ground floor, "to free the surgeons of the expense of furnishing medication upon their own charge". The present Royal Infirmary opened in October 1879.



THE MIDDLESEX HOSPITAL.

Many of the great hospitals of Britain were built by 1760. Initially they were charitable institutions for the care of the sick poor, but gradually they became voluntary hospitals dependent upon subscriptions from philanthropists and potential patients. The first Birmingham hospital, one of forty beds, opened in 1779 and was paid for by subscriptions. Its maintenance and development was due to annual subscriptions, donations and legacies, and a triennial music festival. Now a teaching hospital it was transferred to its present site in 1897.

In 1841 the Queen's Hospital was built to provide clinical training for students at the Sandys Cox Medical School. It

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was the second hospital, after University College Hospital, London, to be built specifically for teaching purposes. Other hospitals were built in Birmingham over a century later.

The London Dispensary for the Infant Poor was established in 1769. Experience gained in foundling hospitals and dispensaries decisively contributed to lower institutional death rates and infant mortality in several countries. Beginning with the General Dispensary in Aldersgate Street, London, founded in 1770, dispensaries rapidly multiplied in the capital and the provinces. By 1800, the country had 38 general dispensaries with approximately 100,000 yearly admissions to out-patient clinics for the ambulatory sick poor.

So by 1800, voluntary hospitals and dispensaries were to be found in England's major cities and centres of population for the labouring poor, there now being thirty general infirmaries in the provinces with two thousand beds. There were new lying-in hospitals for the poor, as well as public and private lunatic asylums, some presided over by a "regularly trained" medical practitioner.

Some of the advances found in British voluntary hospitals spread to the Continent, such as separate beds for each inmate, the separation of patients according to disease, improved meal and medication schedules and better medical record keeping.

The hospital system enabled doctors to observe large numbers of patients, so allowing them to increase their understanding of diseases. Records led to the scrutiny of medical staff by their peers and the lay public. Increasingly the newly acquired knowledge appeared in medical journals and books giving observational data and statistics, thereby further dispersing medical knowledge. Being controlled environments, hospitals became the ideal places for testing new ideas on personal hygiene, ventilation and proper food.

The Nineteenth and Twentieth Centuries.

Ever more specialist institutions came into being, the first, Moorfields Eye Hospital was set up in 1804, and was followed in the next twenty years by eighteen more in the major towns. By the 1860s there were at least 66 special institutions in London alone and the general hospitals were also starting to set up specialist departments, for example in 1862 the Nightingale Ward of King's College Hospital, London was training nurses in midwifery.

The voluntary hospital subscribers, dependent on the sum they had subscribed, gave so many vouchers a year to those who had applied to them for hospital admission, a far from satisfactory system. In 1859 cottage hospitals began to appear in which patients were treated on payment of a weekly sum, a feature which other hospitals took up by the end of the century.

The Poor Law Act of 1834 increased the number of workhouses and placed the care of the poor, which included the sick poor,in the hands of Guardians appointed by each parish. The Act divided the whole country into 834 unions, for example St. Asaph Union covered the large area of Flint and Denbighshire.

England and Wales in 1861 had a population of twenty million and fewer than twelve thousand beds which was totally inadequate, so six years later the Government authorised the construction of infirmaries which were to be separate from any hospital care within the workhouses, and built to a standard similar to those of the voluntary hospitals. European hospitals developed along similar lines but primarily under governmental auspices. In the United States of America, institutions such as the Pennsylvania Hospital of Philadelphia of 1751 and the New York Hospital of 1791, set the pattern of today's private medicine.

By the 1870s one third of those entering Poor Law hospitals were not paupers at the time of admission, and in recognition of this, from 1885 those using such hospitals were no longer deprived of their right to vote. In 1911 more than twice as many hospital beds were to be found in Poor Law hospitals as in voluntary ones.

The 19th. century saw many improvements, in particular cleanliness which cut down mortality rates especially in the now predominant number of surgical cases. Then came anaesthetics, Lister's antisepsis, laboratories for chemical analysis, bacteriological work and X-rays. Experienced administrators were recruited from the Civil Service or the Army.

Madhouses later termed Asylums and then Mental Hospitals.

Whilst in London the religious foundation of St. Mary of Bethlehem (founded 1247) was specialising in lunatics by the 15th. century, it later became notorious as Bethlem or "Bedlam". Here, as elsewhere, the insane dressed in rags, were herded together with no heat, little lighting and poor ventilation. Chained and gagged if they were violent or difficult, they could be ducked in cold water to bring them to their senses. It was generally the responsibility of the family to care for their "non compos mentis " relatives, and they were often locked away in a cellar, attic or barn, as was graphically told in *Jane Eyre.* Similarly in France, it was Philippe Pinet who in 1793 unchained the patients in the 17th. century asylum of Bicetre in Paris.

Charitable asylums were set up in 18th. century Liverpool, Manchester, Newcastle and York, although in much of Europe most of the care of the insane lay with religious orders right up to the present century. In 1796 Tuke's, a wholesale tea and coffee firm in York, founded the York Retreat, a hospital for thirty patients that was clean, quiet and orderly and where inmates were treated almost as

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guests. The great grandson of William, Daniel Hack Tuke in 1885 wrote a scathing report on the asylums in the United States and Canada, although from 1840 the American campaigner, Dorothea Dix, had established more than thirty state asylums with the interest and welfare of patients in mind. Major reforms were instituted.

The establishment of asylums was made compulsory in 1845 in this country which were to be run by public money. Prior to 1800 most mad people were in privately owned asylums of which about fifty had been licensed. (Licensing by law had only been introduced in 1774.) Nowhere in Europe before the 19th. century was there a legal requirement that asylums should be under the control of medically qualified personnel, though in fact some of the best were run by doctors. A series of Acts passed from the 1820s onwards required a medical presence first in public, and then in private, institutions. The number of patients rose from perhaps 10,000 in 1800 to 100,000 in 1900.

From the early 19th. century doctors in France worked in hospitals in order to learn about diseases. The John Hopkins in the USA became regarded as a "Temple of Science", and by the 1850s acute hospitals were the symbols of medical care and dominated medical training. During this period the hospital began to replace the home for the treatment of serious illness. Modern medicine ultimately emerged as being scientifically and hospital based. By the beginning of the 20th. century the hospital service constituted the dominant part of the health care system. The National Health Insurance Act of 1911 was particularly concerned with the provision of sanatorium beds for tuberculosis sufferers, whilst during World War I Marie Curie established more than two hundred X- ray departments in hospitals.

In the 1920s Government finance for health service was reduced, and voluntary hospital finance depended increasingly on the expansion of various non-state insurance schemes, such as the Hospital Savings Association, and on patients' fees. In Canada at this time hospitals were within months of closing for lack of funds.

During the inter-war years the number of maternity beds increased, so much so, that in 1920 only 5% of births were in hospital but rose to 70% in 1944. In about 1925 17% of mothers died during childbirth, and routine antenatal care was ten years away, although the first antenatal bed had been endowed in 1902 in the Edinburgh Royal Maternity Hospital.

To cope with the anticipated war casualties, the Government created the Emergency Medical Service (EMS) in 1938. More than a thousand of the biggest hospitals (a quarter to a third of the total numberof hospitals) were brought under the financial and administrative control of the state. Their resources were assessed and their roles designed to fit into an overall national pattern. The EMS worked well, demonstrating the advantages of centralised planning over the old diffuse arrangements.

The old NHI Act obliged workers to contribute from their wages to the health insurance funds, but the unemployed and non-employed dependents of workers were excluded. By 1936 the BMA and the TUC had linked forces to press for a comprehensive health service covering most of the population and under the control of the state. In 1945 Aneurin Bevan was given the job of introducing the NHS, which became law in November 1946 and the appointed day for a universal and free health service was fixed to come into being for 5 July 1948. Three months later 86%, later rising to 98%, of family doctors had signed up.

So by 1948 there was a tripartite system of health service delivery, via the general practitioner, the public health departments and the hospitals. These hospitals which dominated the health care system in terms of training, the resources they absorbed and status, were nationalised. Teaching hospitals retained full control of their affairs under their separate boards of governors, whilst the hospital management committees of non-teaching hospitals also enjoyed considerable autonomy in day-to-day administration.

Public expenditure on health care services amounted to 3% of gross national product in 1939, and 3.5% at the introduction of the NHS. By the mid 1970s the figure was 6% and more significantly the hospital sector's share of total costs had risen fron one half to two thirds. The re-organisation of 1974 failed to hold down hospital costs, and two further re-organisations followed. In 1982 one tier in the administrative structure was removed, and in 1984 there was a strengthening of management by identifying "general managers" for each level and drawing them from outside businesses. (Actually only one third did so). These changes in the 1980s were the first systematic attempt in the history of the NHS to call authorities to account by annual scrutiny of their work and the use of performance indicators.

This willingness of the state to attack the medical profession's autonomy and to contemplate a reduction in its own role, is a significant reversal of policy, and has led to the changes now currently taking place.

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WILLIAM COOKWORTHY, the Bristol Connection.

F.H.Rawlings.

Joseph Fry, a Bristol apothecary, was the founder of the well known firm of chocolate manufacturers but he is known to have had many other interests.[1] He was apprenticed to Henry Portsmouth of Basingstoke in 1743, paying a premium of £100.[2] He became a burgess of Bristol by redemption in 1753, paying a fine of fifteen guineas, which enabled him to practise as an apothecary in the town.[3] In 1754 he married Anna Portsmouth, the daughter of his former apprentice master.

Joseph probably became involved with William Cookworthy and ceramics through his youngest brother, Cornelius, who was a glassmaker. "By 1765 Cornelius Fry, a friend of William Cookworthy who by then was supplying, among other raw materials, cobalt from Saxony for blue glass, had joined the partnership."[4] Also it is known that Cookworthy travelled for the benefit of his business as a wholesale chemist & druggist, visiting Bristol on many occasions. Cookworthy, the Frys and Richard Champion would in any case have met at Quaker meetings as Cookworthy was a well-known teacher and preacher at the Friends' meetings.[5]

It has been stated that, "Mr Fry was a good chemist for his day" and that he "assisted Champion in prosecuting the porcelain manufacture."[6] Certainly, Joseph made financial contributions to both the Plymouth and Bristol projects. The Plymouth Porcelain Company was set up with either a capital of £210 or £280. There were fourteen shares each of either £15 or £20 of which Fry held at least one. Production lasted from 1768 to 1770 when the work was transferred to the Bristol company.[7]

The Bristol company - William Cookworthy & Co - founded in 1768 had a capital of £6,000 to which Joseph Fry had subscribed £1,500. Cookworthy's contribution to the company was his 'know-how' and the patent. Richard Champion also contributed £1,000 to the company. In 1773 Cookworthy sold his interest and patent to Champion and the name changed to - Richard Champion & Co. Joseph Fry remained a shareholder.

"This English porcelain was in commercial production for only a dozen years or so after the patent was granted in 1768. It is now keenly collected and extremely valuable, but neither Cookworthy at Plymouth, nor his successor Richard Champion at Bristol made a penny profit out of the enterprise.... Champion was by 1781 financially ruined in consequence of a parliamentary struggle (in which he was skilfully opposed, largely by Wedgwood) to extend by fourteen years the term of the original patent. All production at Bristol had by then ceased. This was the virtual end of the manufacture of true porcelain in England."[8]

The factory of Richard Champion & Co at No.15, Castle Green was closed in 1778, the 1783 Directory listing Israel Carey & Son, pipe makers at this address. They remained there until 1792, presumably using the Champion ovens for the manufacture of their clay pipes.

Notes and References.

1. The chocolate manufacturing firm became registered as "J.S.Fry & Sons", the name being taken from Joseph's third son, Joseph Storrs Fry, who continued the business after his father's death.
2. Public Record Office, Inland Revenue Apprenticeship Records, I.R./1/17. The apprenticeship was for seven years.
   Letters and diaries of contemporary Quakers such as Thomas Pole and James Jenkins often refer to Henry Portsmouth as "Dr Portsmouth" and recollections of his descendents usually credit him with an M.D. No proof as yet has been found of any university awarding him such a degree. The apprenticeship records always term him "Apothecary and Surgeon".
3. Bristol Record Office, Bristol Burgess Books.
4. C.Witt, *Bristol Glass,* 1984,
5. W.J.Poutney, *Old Bristol Potteries,* 1920.
6. H.Owen, *History of the Manufacture of "The True Porcelain"*, 1873
7. A.D.Selleck, *Cookworthy and his circle*, Plymouth, Baron Jay, 1978,
8. *Ibid.*

Medallion commemorating the bicentenary of J.S. Fry & Sons.

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